Missouri Department of Natural Resources
Air Pollution Control Program
2024 Monitoring Network Plan

July 11, 2024

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Summary of Proposed and Recent Changes

The Missouri Department of Natural Resources (department) operates an extensive network of ambient air monitors. Missouri's Monitoring Network Plan describes the network and discusses proposed and recent changes. The changes are summarized below.

Proposed Changes

1. The department proposes to monitor air toxics in Kansas City and to evaluate low-cost sensors for particulate matter and other pollutants at multiple sites in Missouri subject to funding under an Inflation Reduction Act Clean Air Grant. The start date of the monitoring will be as soon as possible.

2. The department plans to replace the 1405-DFs at Blair Street, Forest Park and the Kansas City area near-roadway site with Teledyne API T640X instruments if the upgraded firmware shows comparability to the FRM results; otherwise, the replacement will be with new 1405-Fs.

3. The department plans to replace aging 1405-Fs in the network with T640 instruments, starting with the Ladue and Liberty sites. This replacement is contingent on upgraded firmware for the T640 favorably comparing with the FRM results; otherwise, the replacement will be with new 1405-Fs.

4. The department plans to establish a new Kansas City area near-roadway site as soon as possible, to replace the discontinued Blue Ridge I-70 site. A site has been selected and approved by the EPA Region 7 Administrator on November 19, 2023. The department has begun site preparation, and lease agreements are in the final stages of development. The department will install the site and begin monitoring as soon as possible.

5. The department will submit an Enhanced Monitoring Plan (EMP) by November 7, 2024 as required by 40 CFR Part 58 Appendix D 5(h). The EMP is required as a result of the St. Louis metropolitan area being reclassified to a moderate non-attainment area on November 7, 2022.

Changes since the 2023 Monitoring Network Plan

The department reduced the frequency of lead monitoring at the Mott Street site in Herculaneum from every day to every third day for the primary sampler and from every other day to every sixth day for the collocated sampler effective January 1, 2024, as proposed in the 2023 Monitoring Network Plan.

How to Make Public Comments Concerning this Plan

The department is posted Revision 0 of the 2024 Monitoring Network Plan on the web for public review and comment on May 31, 2024. The department accepted comments concerning the plan electronically at cleanair@dnr.mo.gov, or by mail to the following address:

Missouri Department of Natural Resources
Air Pollution Control Program
Air Quality Analysis Section/Air Monitoring Unit
PO Box 176
Jefferson City MO 65102

The department has included all comments received through June 30, 2024, and responses to comments in Appendix 2 of the final version of the plan (Revision 1). Additionally, the department will identify corrections and changes to the plan in Appendix 2.

Introduction

The department operates an extensive network of ambient air monitors to comply with the Clean Air Act and its amendments. The Ambient Air Quality Monitoring Network for Missouri includes State and Local Air Monitoring Stations (SLAMS), SPMs and an NCore monitoring site consistent with requirements in federal regulation in 40 C.F.R. § 58.

40 C.F.R. § 58.10 requires states to submit an annual monitoring network plan to EPA, including any proposed network changes. In accordance with 40 C.F.R. § 58.10, Missouri must include in the plan a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D and E of 40 C.F.R. § 58, where applicable. All monitors in the Missouri air monitoring network, including those operated by the state and industries under state review, meet the applicable requirements of 40 C.F.R. § 58. Any changes to the SLAMS require approval by the EPA Regional Administrator.

The plan must contain the following information for each monitoring station in the network; (See Appendix 1 and the body of this document):

1. The AQS site identification number for existing stations.
2. The location, including the street address and geographical coordinates, for each monitoring station.
3. The sampling and analysis method used for each measured parameter.
4. The operating schedule for each monitor.
5. Any proposal to remove or move a monitoring station within a period of 18 months following the plan submittal.
6. The monitoring objective and spatial scale of representativeness for each monitor.
7. The identification of any sites that are or are not suitable for comparison against the annual $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS).
8. The metropolitan statistical area, core-based statistical area (CBSA), combined statistical area or other area represented by the monitor.

EPA requires a network assessment every five years. The department completed the most recent network assessment in June 2020.

Network Design

Federal regulation 40 C.F.R. § 58 establishes the design criteria for the ambient air monitoring network. The state must design the network to meet three general objectives:

1. Provide air pollution data to the public in a timely manner.
2. Support compliance with ambient air quality standards and emissions strategy development.
3. Support air pollution research studies.

Specific objectives for the monitoring sites are:

1. Determine the highest pollution concentrations in an area.

2. Measure typical concentrations in areas of high population density.
3. Determine the impact of significant sources or source categories.
4. Determine general background levels.
5. Determine the extent of regional pollutant transport among populated areas.

Minimum site requirements, based on CBSA population, are provided for ozone (O_3), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), airborne particulate matter with aerodynamic diameter equal to or smaller than 10 micrometers (PM_{10}) and airborne particulate matter with aerodynamic diameter equal to or smaller than 2.5 micrometers ($PM_{2.5}$).

40 C.F.R. § 58 Appendix E establishes the specific requirements for monitor/probe siting to ensure the ambient data represents the stated objectives and spatial scale. The requirements are pollutant/scale specific. Periodically, department staff visit and evaluate each monitoring site to ensure compliance with the requirements of 40 C.F.R. § 58 Appendix E. Additional details concerning the sites are available in Appendix 1.

Unanticipated Network Modifications

Changes to the monitoring network may occur outside the annual monitoring network planning process due to unforeseen circumstances including, but not limited to, severe weather, natural events, changes in property ownership, changes in federal funding, or changes in funding available from air emission fees from industrial facilities. The department will communicate any changes to the network that result from conditions outside the state's logistical control and not included in the current monitoring network plan to EPA Region 7 staff and identify such changes in the subsequent annual monitoring network plan.

Special Purpose Monitors

A monitor is designated as an SPM consistent with the regulatory definition in 40 C.F.R. § 58.20 (a): "An SPM is defined as any monitor included in an agency's monitoring network that the agency has designated as a special purpose monitor in its annual monitoring network plan and in AQS, and which the agency does not count when showing compliance with the minimum requirements of this subpart for the number and siting of monitors of various types."

SPMs may be established for many different purposes, including but not limited to NAAQS compliance evaluation, air quality research and characterization, air quality investigation and monitoring method evaluation.

The department includes SPMs in the annual monitoring network plan required by 40 C.F.R. § 58.10. The department installs or approves the installation of these monitors consistent with 40 C.F.R. § 58.20 (f). The department removes, or allows the removal of, these monitors following federal guidelines, which are different for SPMs than for SLAMS. There is more description of each SPM later in the document. The Missouri Monitoring Network Description, Appendix 1, specifies SPM sites and SLAMS sites.

Industrial Monitors

Ambient air monitoring sites classified as Industrial, in this document, indicate sites the industrial source or its contractor operates under an approved industrial monitoring Quality Assurance Project Plan (QAPP) and departmental Quality Management Plan (QMP). Department staff conduct quality assurance audits of these monitoring sites consistent with the approved QAPP.

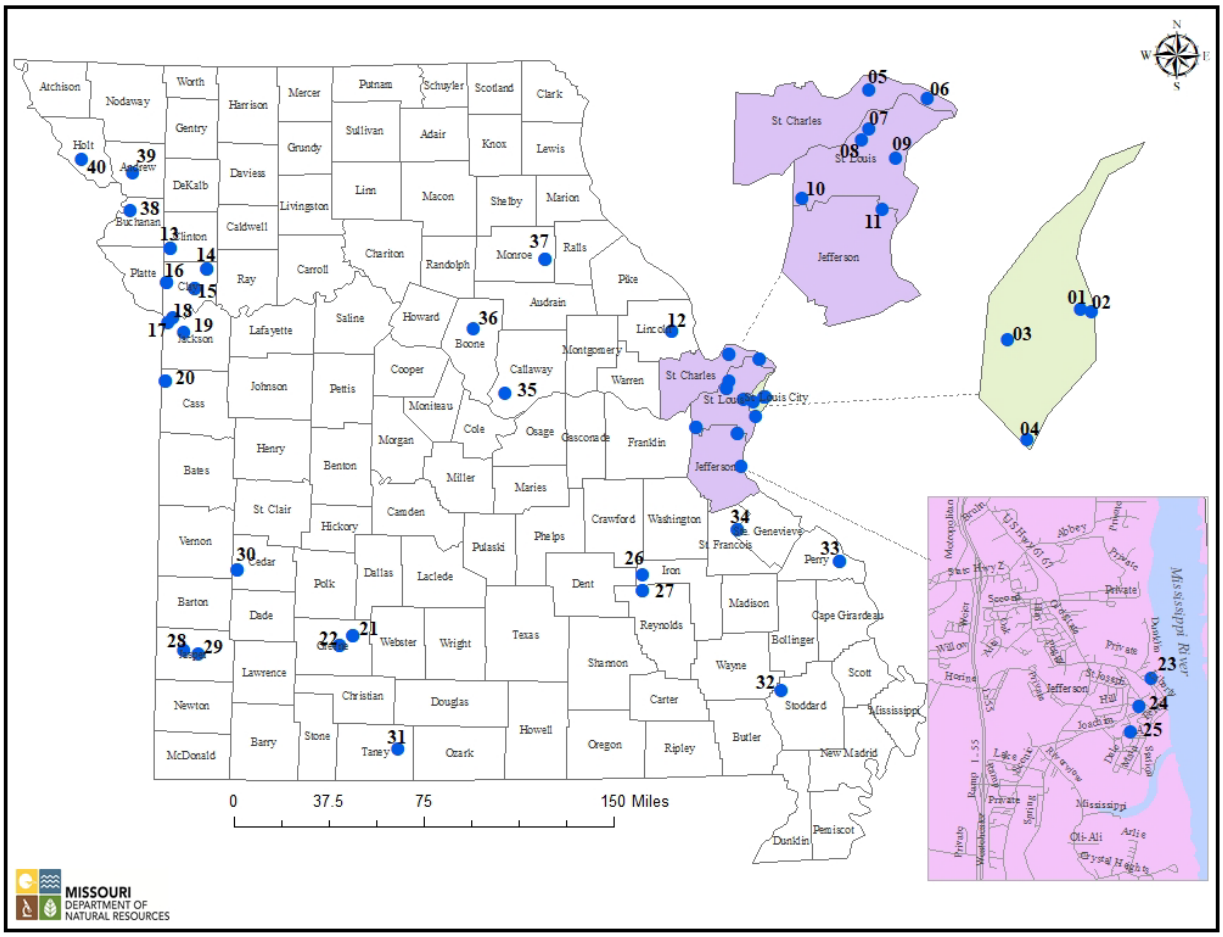
Missouri oversees ambient air monitoring sites operated by industrial sources for NAAQS compliance. The department has incorporated these industrial sites in the annual Monitoring Network Plan and the ambient air monitoring network. Currently, lead and SO_2 industrial sites are in the Missouri monitoring network.

Some industrial lead monitoring sites are classified in the AQS as non-regulatory due to the sites transitioning to non-ambient status. However, the department has required continued monitoring at these locations in agreements with the industrial source for trends analysis or other purposes.

2024 Ambient Air Monitoring Network, State Sites

The 2024 statewide monitoring network is shown in the following map and table.

2024 Missouri State Monitoring Network



Legend (State's Monitoring Network)

St. Louis Area

Site#	Site Name	Parameter Monitored
01	Blair Street^	PM_{10}, $PM_{2.5}$, $PM_{2.5}$(Spec), PMCoarse, PM_{10}-LC, PM_{10}-Pb, O_3, SO_2, NO_2, NO_y, NOx, NO, CO, Carbonyls, PAHs, VOCs, Air Toxics, Carbons, PM_{10} Metals, Prec, WS, WD, OT, IT, SR, BP, RH, PAMS
02	Branch Street	PM_{10}, $PM_{2.5}$, WS, WD, OT, IT, BP, RH
03	Forest Park	$PM_{2.5}$, NO_2, NOx, NO, CO, BC, WS, WD, OT, IT, SR, BP, RH, Prec
04	South Broadway	$PM_{2.5}$, IT, BP, RH, OT
05	Orchard Farm	O_3, IT
06	West Alton	O_3, WS, WD, OT, IT, SR
07	Rider Trail I-70	NO2, NOx, NO, WS, WD, OT, IT, SR, Prec, BP SO_2 (RES)
08	Maryland Heights	O_3, IT
09	Ladue	$PM_{2.5}$, OT, IT, BP, RH
10	Pacific	O_3, IT
11	Arnold West	PM_{10}, $PM_{2.5}$, $PM_{2.5}$(Spec), IT, O_3, WS, WD OT, IT, BP, RH
12	Foley West*	O_3, IT

Kansas City Area

Site#	Site Name	Parameter Monitored
13	Trimble	O_3, IT
14	Watkins Mill	O_3, IT
15	Liberty	$PM_{2.5}$, O_3, OT, IT, SR, BP, RH
16	Rocky Creek	O_3, IT
17	Troost	$PM_{2.5}$, PM_{10}, SO_2, NO_2, NOx, OT, IT, BP
18	Front Street	PM_{10}
19	Blue Ridge I-70+	$PM_{2.5}$, NO_2, NOx, NO, CO, BC, WS, WD, OT, IT, SR, BP, RH, Prec
20	Richards Gebaur-South	$PM_{2.5}$, O_3, WS, WD, OT, IT, BP, RH

Springfield Area

Site#	Site Name	Parameter Monitored
21	Fellows Lake	O_3, IT
22	Hillcrest High School	O_3, PM_{10}, $PM_{2.5}$, OT, IT, BP, RH

Herculaneum Area

Site#	Site Name	Parameter Monitored
23	Sherman	Pb
24	Dunklin High School	Pb
25	Mott Street	Pb, SO_2

New Lead Belt Area

Site#	Site Name	Parameter Monitored
26	Buick NE	Pb, SO_2, WS, WD, IT, OT, BP
27	Oates	Pb

Outstate Area

Site#	Site Name	Parameter Monitored
28	Alba	O_3, IT
29	Carthage	PM_{10}, WS, WD, IT
30	El Dorado Springs	$PM_{2.5}$, O_3, WS, WD, OT, IT, BP, RH
31	Hercules Glades	$PM_{2.5}$ (Spec)-IMPROVE
32	Mingo	$PM_{2.5}$ (Spec)-IMPROVE
33	Farrar	O_3, IT
34	Bonne Terre	O_3, IT, SR
35	New Bloomfield	O_3, IT
36	Finger Lakes	O_3, IT
37	Mark Twain State Park	PM_{10}, SO_2, NO_2, NOx, NO, O_3, WS, WD, IT
38	St. Joseph Pump Station	PM_{10}, $PM_{2.5}$, PM_{10}-LC, WS, WD, OT, IT, RH, BP
39	Savannah	O_3, IT
40	Forest City, Exide	Pb

Acronyms

PM_{10}	Particulate Matter (Diameter size ≤10 micrometer
$PM_{2.5}$	Particulate Matter (Diameter size ≤2.5 micrometer)
PMCoarse	Particulate Matter (Diameter size between 2.5 and 10 micrometer)
Spec	Speciation
SO_2	Sulfur Dioxide
NO_2	Nitrogen Dioxide
NO	Nitric Oxide
NOy	Reactive Oxides of Nitrogen
NOx	Oxides of Nitrogen
O_3	Ozone
CO	Carbon Monoxide
Pb	Lead (High Volume)
BC	Black Carbon
Prec	Precipitation
WS	Resultant Wind Speed
WD	Resultant Wind Direction
OT	Outside Temperature
IT	Inside Temperature
SR	Solar Radiation
BP	Barometric Pressure
RH	Relative Humidity
IMPROVE	Interagency Monitoring of Protected Visual Environment (Regional Haze)
RES	Research
PAMS	Photochemical Assessment Monitoring Station
PAHs	Polycyclic Aromatic Hydrocarbons

* Relocated from former Foley site
^PM10-Pb at Blair is NAAQS excluded
+ Site discontinued; plan to relocate

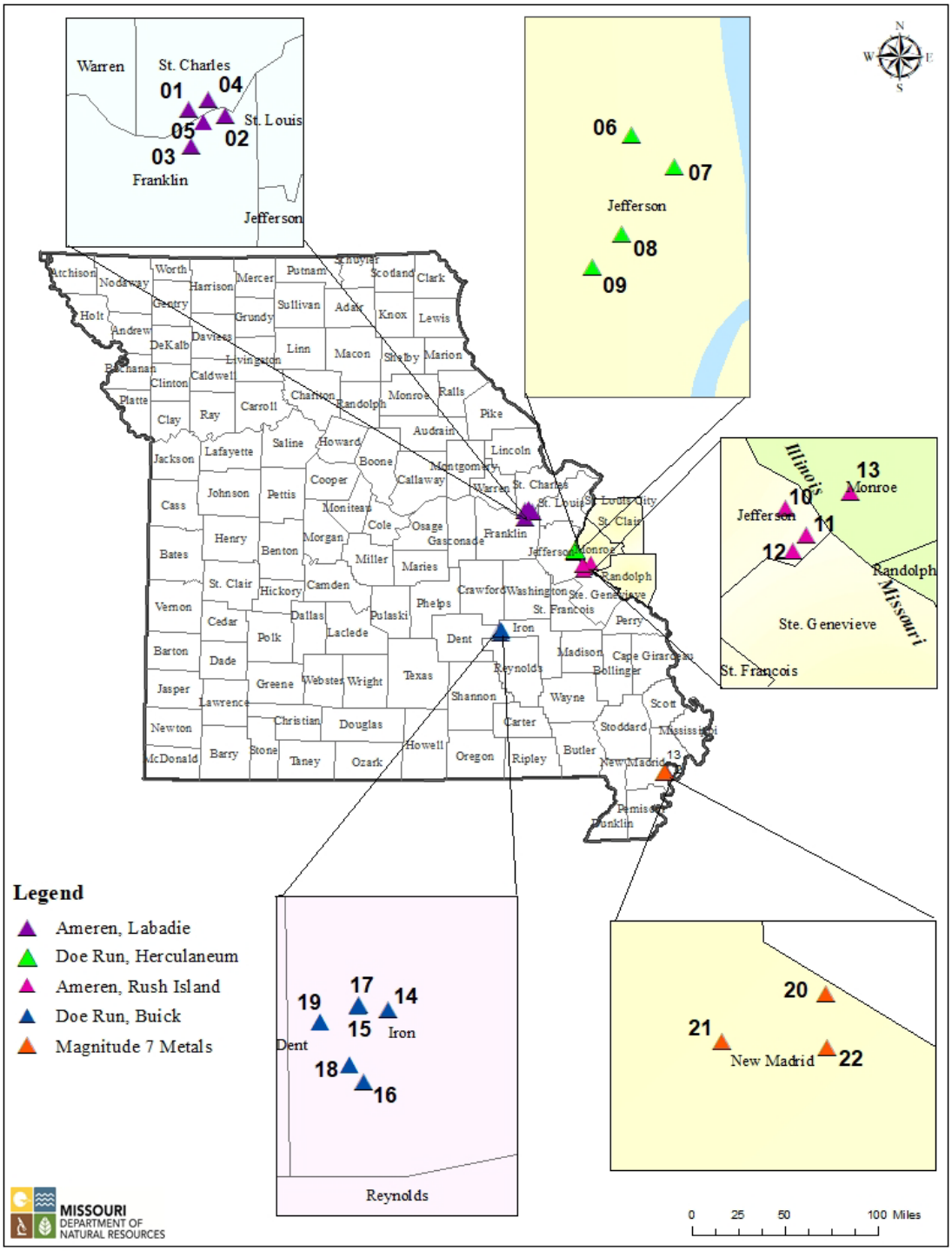
Notes:

1. The Blue Ridge I-70 site has been discontinued. A new near-roadway site is planned to be established in the Kansas City area (see Section 7).
2. The acronym $PM_{10\text{-}LC}$ is also commonly referred to as PM_{10c} when collected with a low volume sampler consistent with 40 C.F.R. § 50 Appendix O. $PM_{10\text{-}LC}$ means particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers where the concentration is reported at local conditions of ambient temperature and barometric pressure. $PM_{10\text{-}LC}$ is used in this document to describe any continuous or filter based PM_{10} low volume measurement concentration reported at local conditions of ambient temperature and barometric pressure.
3. PM_{10} means particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers where the concentration is adjusted to EPA reference conditions of ambient temperature and barometric pressure (25 °C and 760 millimeters of mercury or STP).
4. PMCoarse is also frequently referred to as $PM_{10\text{-}2.5}$.

2024 Ambient Air Monitoring Network, Industrial Sites

Monitoring sites operated by industries are shown in the following map and listed in the following table.

2024 Missouri Industry Monitoring Networks



Legend (Industry Monitoring Network)

Ameren, Labadie Energy Center

Site#	Site Name	Parameter Monitored
01	Northwest	SO_2, (WS, VWS, WD, OT, σ_ϕ, σ_e, RH)^
02	Valley	SO_2, (WS, VWS, WD, OT, SR, BP, RH, Prec, σ_ϕ, σ_e)^
03	Southwest	SO_2
04	North	SO_2
05	Labadie Plant	SODAR (WS, WD, OT, σ_e, σ_ϕ)^

Doe Run, Herculaneum

Site#	Site Name	Parameter Monitored
06	Dunklin	Pb
07	Broadway	(WS, WD, OT, SR, BP, RH, Prec, σ_e)^[a]
08	Mott Street	Pb
09	North Cross	Pb

Ameren, Rush Island Energy Center

Site#	Site Name	Parameter Monitored
10	Weaver-AA	SO_2
11	Johnson Tall Tower	(WS, VWS, WD, OT, σ_ϕ, σ_e)^
12	Natchez	SO_2
13	Fults, IL	SO_2, (WS, VWS, WD, OT, SR, BP, RH, Prec, σ_ϕ, σ_e)^

Doe Run, Buick

Site#	Site Name	Parameter Monitored
16	Buick NE	Pb
17	Buick North#5*	Pb
18	Buick South#1*	Pb, (WS, WD, OT, SR, BP, RH, Prec, σ_e) ^[a]
19	Hwy 32 Northeast	SO_2
20	West Entrance	SO_2
21	County Road 75	SO_2

Magnitude 7 Metals

Site#	Site Name	Parameter Monitored
22	Site #1	SO_2
23	Site #2	SO_2
24	Site #3	SO_2, (WS, WD, OT)

Acronyms

SO_2	Sulfur Dioxide
Pb	Lead (High Volume)
σ_e	Sigma Theta (Standard Deviation of Horizontal Wind Direction
WS	Resultant Wind Speed
WD	Resultant Wind Direction
OT	Outside Temperature
SR	Solar Radiation
BP	Barometer Pressure
RH	Relative Humidity
σ_ϕ	Sigma Theta (Standard Deviation of the Vertical Wind Speed)
Prec	Precipitation
VWS	Vertical Wind Speed

[a]	Metrological Data is not submitted to the EPA Air Quality (AQS) Database
^	Regulatory Dispersion Modeling Grade Parameters
*	Non-Ambient Monitor

Monitoring Network and Proposed Changes

1. Lead (Pb) Monitoring Network

EPA requires the monitoring of lead sources emitting 0.50 tons per year (tpy) or more. Prior to 2010, EPA required monitoring for sources emitting one tpy or more. All airports in Missouri are exempt from this requirement. A review of 2022 emission data did not identify any new sources emitting greater than 0.50 tpy. Only the Doe Run Buick smelter shows emissions greater than 0.50 tpy. The department will continue to review emission data for new sources in the future.

1.1 Doe Run-Operated Sites

Doe Run operates lead monitoring sites in the vicinity of its industrial facilities in Herculaneum and Boss. The operation of some of these sites are under consent judgments or agreements with the department. Doe Run operates other sites voluntarily.

Doe Run Herculaneum also operates one 10-meter meteorological monitoring tower at the Broadway site as per the language set forth under the 2011 Consent Judgment. Doe Run Herculaneum discontinued the Broad Street 40-meter tower per the Consent Judgment.

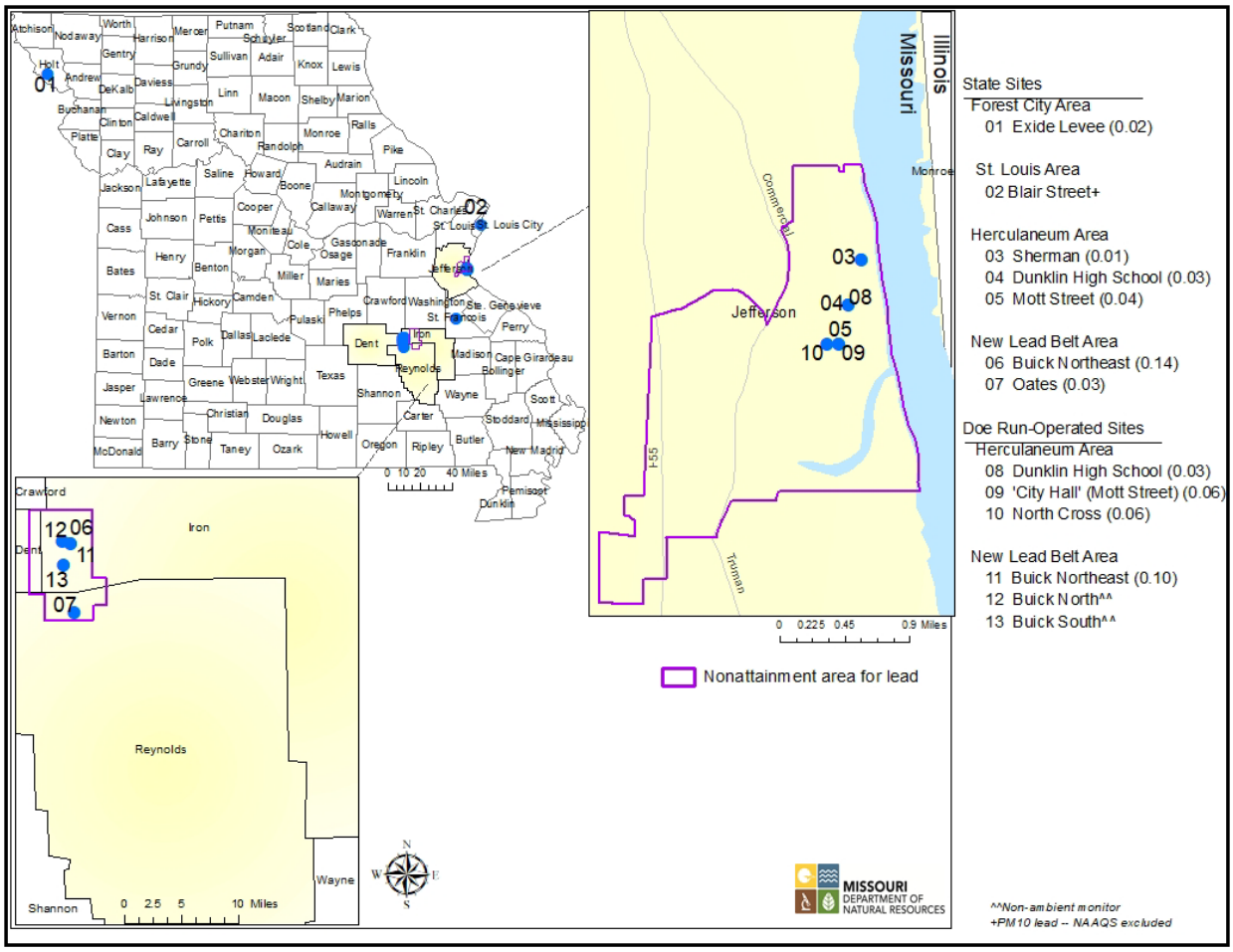
1.2 State-Operated Sites

The department reduced the frequency of lead monitoring at the Mott Street site in Herculaneum from every day to every third day for the primary sampler and from every third day to every sixth day for the collocated sampler effective January 1, 2024, as proposed in the 2023 Monitoring Network Plan.

The 2024 lead monitoring network is shown in the following map.

2024 Missouri Lead Monitoring Network*, NAAQS=0.15µg/m^3 (3 month).

(Numbers in parenthesis are 2021-2023 Design Values)



*No changes to the lead network are proposed in this plan.

2. Sulfur Dioxide (SO_2) Monitoring Network

EPA reviewed the SO_2 standard and announced, in March 2019, the standard would remain at 75 parts per billion (ppb), established in 2010. The minimum required SO_2 monitoring network is determined by the Population Weighted Emissions Index (PWEI). The department updated the PWEI analysis using the most recent population and emission data, 2020 CBSA definitions and 2023 estimated population data from the United States Census Bureau and 2020 National Emission Inventory (NEI) emissions data. The following table summarizes the results. The required numbers of monitoring sites based on the PWEI remain unchanged from previous years; two sites in the St. Louis CBSA, and one in the Kansas City CBSA. All other Missouri CBSAs require no monitoring sites. The department and the Illinois Environmental Protection Agency meet this requirement in the St. Louis area with the Blair Street site in Missouri and the East St. Louis site in Illinois, and in the Kansas City area with the Troost site. The SO_2 monitoring network exceeds requirements by including the Wood River site in Illinois, the Herculaneum site in Missouri and the JFK site in Kansas. Communications received from the Illinois Environmental Protection Agency and the Kansas Department of Health and Environment (KDHE) indicate those agencies expect to continue SO_2 monitoring at these sites.

In addition to the minimum network requirements, the department oversees several industrial SO_2 monitoring sites and one additional site. The following sections detail this information.

Population Weighted Emission Index (PWEI) Summary

Area	Estimated 2023 Population	2020 SO2 Emissions (tpy)	PWEI	Required Number of SO2 Monitors
St. Louis	2,796,999	62,707.68	175,393	2
Kansas City	2,221,343	5,073.41	11,270	1
Springfield	491,053	2,468.12	1,212	0
Moberly	24,109	13,743.06	331	0
Sikeston	37,889	4,298.53	163	0
Columbia	216,511	522.33	113	0
Joplin	185,733	259.29	48	0
Fort Madison-Keokuk	56,392	800.50	45	0
Farmington	67,058	624.97	42	0
Jefferson City	150,733	258.05	39	0
Quincy	74,259	466.25	35	0
Cape Girardeau	98,223	339.62	33	0
St. Joseph	118,475	269.63	32	0
Hannibal	38,825	742.77	29	0
West Plains	40,735	321.08	13	0
Branson	56,775	227.13	13	0
Rolla	45,284	154.51	7	0
Poplar Bluff	52,754	120.65	6	0
Lebanon	36,680	129.83	5	0
Fort Leonard Wood	53,812	86.55	5	0
Kirksville	29,175	107.89	3	0
Sedalia	43,530	55.54	2	0
Warrensburg	54,962	43.02	2	0
Mexico	24,394	30.55	1	0
Maryville	20,695	31.36	1	0
Kennett	27,032	20.58	1	0
Marshall	23,049	20.10	0	0

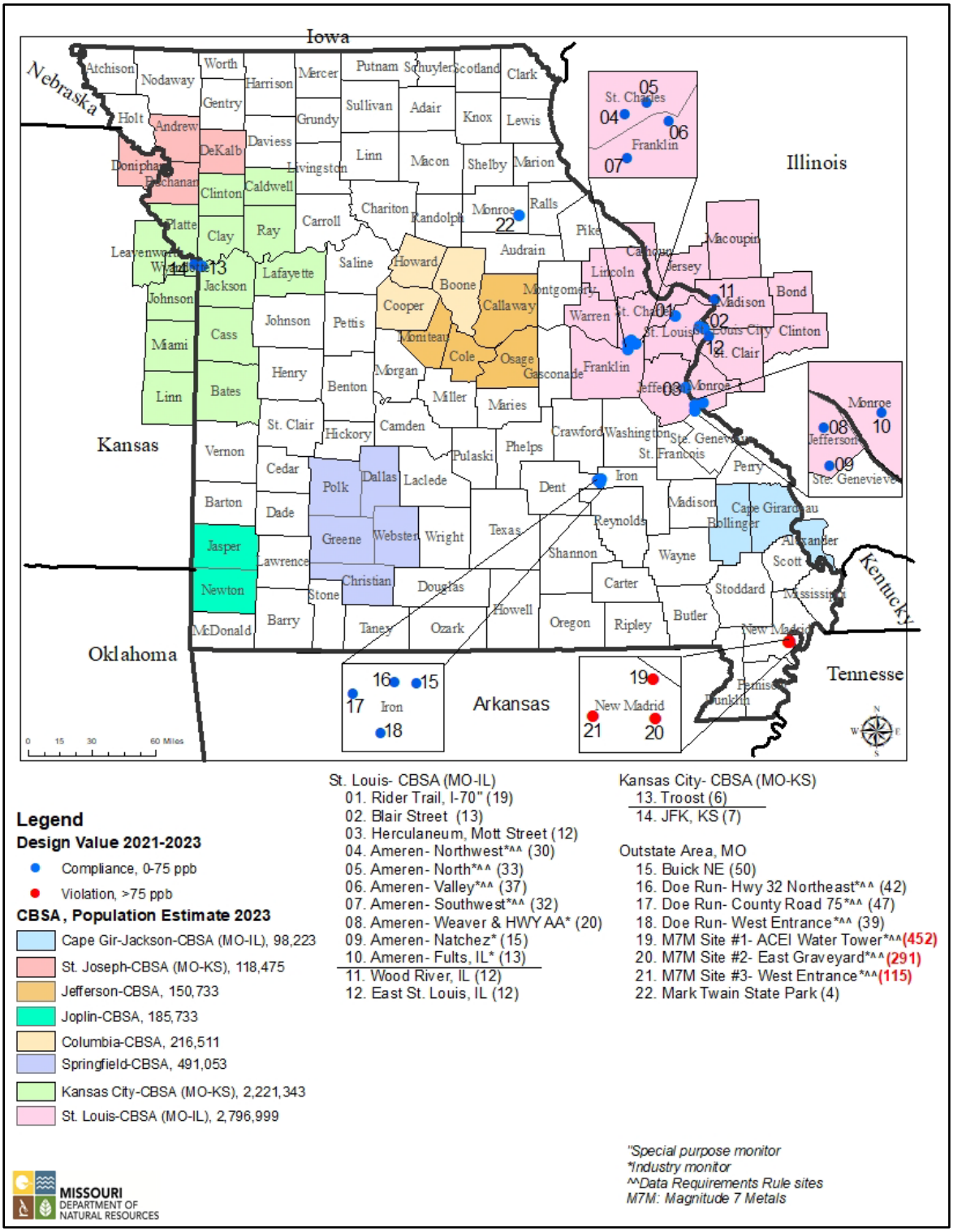
PWEI=population*SO2(tpy)/1,000,000

PWEI $\geq$ 1,000,000: 3 monitors
1,000,000 > PWEI $\geq$ 100,000: 2 monitors
100,000 > PWEI $\geq$ 5,000: 1 monitor

Population estimates from https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html
SO2 emissions from 2020 NEI including fire emissions

The department's 2024 SO_2 monitoring network is shown in the following map.

2024 Missouri Sulfur Dioxide (SO_2) Monitoring Network*, NAAQS=75 ppb (1 hour). (Numbers in Parentheses are 2021-2023 Design Values)



*No changes to the SO_2 network are proposed in this plan.

In 2015, EPA finalized the SO_2 Data Requirements Rule (DRR). This rule required air agencies to characterize air quality, either by monitoring or modeling, around sources that emit 2,000 tpy or more of SO_2.

Sources monitoring due to the DRR include Ameren Labadie Energy Center, Magnitude 7 Metals (formerly Noranda Aluminum) and Doe Run Buick Resource Recycling Facility. In addition, Ameren Rush Island Energy Center conducts monitoring based on an agreement with the department associated with the Jefferson County maintenance plan submitted to EPA in December 2017. The following sections include discussions of these sources.

The industrial sources are conducting the SO_2 monitoring in accordance with the SLAMS requirements in 40 C.F.R. § 58. The department reviewed and approved the siting of the monitors based on federal regulations. To meet the requirements of the DRR, the monitors need a minimum of three years of monitoring data, which is now complete. However, the sources cannot discontinue monitoring without EPA approval based on the requirements of 40 C.F.R. § 51.1203(c) (3) or 40 C.F.R. § 58.14.

2.1 Industrial SO_2 and Meteorological Monitoring near the Labadie and Rush Island Energy Centers

Ameren operates two SO_2 ambient air monitoring networks around the Labadie and Rush Island power plants. The department classifies the monitors in the Ameren networks as industrial SO_2 monitors. Sections 2.1.1 and 2.1.2 describe the current status of the Labadie and Rush Island SO_2 monitoring networks.

2.1.1 Labadie Energy Center

Two industrial SO_2 ambient air monitoring sites and a meteorological monitoring station began operation in April 2015, in the area around the Ameren Labadie Energy Center, located at 226 Labadie Power Plant Road in Franklin County. Ameren installed two additional industrial SO_2 monitoring sites southwest and north of the Labadie Energy Center, which began operation on Jan. 1, 2017. In addition, Ameren added meteorological monitoring using a 10-meter tower at the Northwest site. A sound detection and ranging (SODAR) instrument was initially located at the Valley site, relocated to the Northwest site in February 2017, and relocated again to the Labadie plant site in August 2017. Ameren operates these monitoring sites (see the following table) under a department-approved QAPP. The 2015 and 2016 monitoring network plans provide a detailed discussion on the modeling results that support the site selection. These monitors have not shown a violation of the NAAQS. EPA proposed redesignation of the area in St. Charles and Franklin counties around this facility from unclassifiable to attainment in August 2020, but the redesignation has not yet been finalized as of this writing (May 2024).

Summary of Labadie Area Industrial Monitoring Stations:
Monitoring Objective: Source Oriented
Spatial Scale of representativeness: Middle Scale (100 square meters [m^2] to 0.5 square kilometer [km^2])
Labadie Northwest -SO_2, 10-Meter Meteorological Station. (Latitude: 38.5818 Longitude: -90.865528)
Labadie Valley -SO_2, 10-Meter Meteorological Station. (Latitude: 38.572522 Longitude: -90.796911)
Labadie Southwest -SO_2, (Latitude: 38.52825 Longitude: -90.86301)
Labadie North -SO_2, (Latitude: 38.59557 Longitude: -90.82864)
Labadie Plant -SODAR, (Latitude: 38.54860 Longitude -90.83750)

2.1.2 Rush Island Energy Center

On March 23, 2015, the department and Ameren entered into a consent agreement (see Appendix 3 of the 2015 Monitoring Network Plan) that included Ameren installing and operating an SO_2 monitoring network around the Rush Island Energy Center under department oversight. The siting of these monitors was consistent with the technical process described in the SO_2 DRR. The Rush Island monitoring network design was based on an evaluation of dispersion modeling results, as described in the 2015 and 2016 Monitoring Network Plans. This network began operation in December 2015. These monitors have not shown a violation of the NAAQS. Ameren operates these sites under a department-approved QAPP, which includes performance evaluations (audits) by department staff.

The department requested in February 2016 that EPA make a clean data determination for the Jefferson County area, and EPA published a clean data determination for the area on Sept. 13, 2017. The department submitted to EPA a redesignation request and maintenance plan in December 2017, followed by a maintenance plan supplement in April 2021. EPA proposed redesignation of the Jefferson County SO_2 nonattainment area to attainment of the 2010 SO_2 standard on June 29, 2021 (86 F. R. 34177). In January 2022, EPA published a final rule to approve Missouri's maintenance plan for this area and redesignate it to attainment, effective on Feb. 28, 2022.

Summary of Rush Island area Industrial Monitoring Stations:
Monitoring Objective: Source Oriented
Spatial Scale of representativeness: Middle Scale (100 m^2 to 0.5 km^2)
Weaver-AA -SO_2. (Latitude: 38.144529 Longitude: -90.304726)
Natchez -SO_2, (Latitude: 38.10525 Longitude: -90.29842)
Fults, IL, -SO_2, 10-Meter Meteorological Station (Latitude: 38.15908 Longitude: -90.22728)
Johnson Tall Tower -Meteorological Station Only, anemometers at 62.5 meter (m) and 132.5 m levels (Latitude: 38.11999 Longitude: -90.28214)

2.2 Industrial SO_2 and Meteorological Monitoring near the Doe Run Buick Resource Recycling Facility

The Doe Run Company began SO_2 monitoring at three sites in the area around the Buick Resource Recycling Facility near Boss starting Jan. 1, 2017. Meteorological monitoring is also

conducted at the Buick South lead monitoring site, south of the facility. These sites are operated under a department-approved QAPP, which includes performance evaluations (audits) by department staff. Locations of these ambient SO_2 monitoring sites were determined on the basis of air quality modeling of the impact of facility emissions, as described in the 2016 Monitoring Network Plan. These monitors have not shown a violation of the NAAQS, and EPA finalized the designation of Iron County, where this facility is located, as attainment/unclassifiable in March 2021 (effective April 2021).

Summary of Doe Run Buick Area Industrial Monitoring Stations:
Monitoring Objective: Source Oriented
Spatial Scale of representativeness: Middle Scale (100 m^2 to 0.5 km^2)
West Entrance -SO_2. (Latitude: 37.63211 Longitude: -91.13565)
County Road 75 -SO_2, (Latitude: 37.64876 Longitude: -91.14890)
Hwy. 32 Northeast (Former PSD site) -SO_2, (Latitude: 37.65319 Longitude: 91.12795)

2.3 Industrial SO_2 and Meteorological Monitoring near the Magnitude 7 Metals (formerly Noranda Aluminum) Facility

Magnitude 7 Metals (M7M) is conducting SO_2 monitoring at three sites and meteorological monitoring at one in the area around its facility near New Madrid. Monitoring at these sites started in January 2017. M7M operates these sites under a department-approved QAPP, which includes performance evaluations (audits) by department staff. The department determined the locations for these ambient SO_2 monitoring sites based on air quality modeling of the impact of facility emissions.

In March 2021 (effective April 2021), EPA finalized the designation of an area surrounding the M7M facility as a nonattainment area for the SO_2 NAAQS, based on 2017-2019 data. EPA designated the remainder of New Madrid County as attainment/unclassifiable. All three of the M7M sites continued to be in violation of the NAAQS based on 2019 through 2021, 2020 through 2022, or 2021 through 2023 data. On Oct. 31, 2022, the department proposed a New Madrid SO_2 nonattainment area SIP revision, which was adopted by the Missouri Air Conservation Commission on April 27, 2023. The SIP revision addresses the nonattainment area planning requirements of the Clean Air Act. The plan includes two new enforceable consent agreements for the two major emitting facilities located in the nonattainment area, the M7M primary aluminum smelter and the Associated Electric Cooperative New Madrid Power Plant. In addition to new enforceable emission rates, the control strategy in this plan includes building a new 65-meter stack at the M7M facility. This SIP revision demonstrates attainment for the New Madrid County SO_2 nonattainment area using the newly established enforceable emission rates in an atmospheric dispersion modeling analysis. The SIP revision is currently pending EPA approval.

In January of 2024, M7M curtailed all operations at the facility. This action suspended the consent agreement requirement for the facility to build the new stack unless and until the facility restarts operations. Monitored SO_2 concentrations decreased at the time facility operations were suspended, but monitoring is continuing at the three sites near that facility.

Summary of Magnitude 7 Metals area Industrial Monitoring Stations:
Monitoring Objective: Source Oriented
Spatial Scale of representativeness: Middle Scale (100 m^2 to 0.5 km^2)
Site 1 -SO_2, (Latitude: 36.51361 Longitude: -89.56111)
Site 2 -SO_2, (Latitude: 36.50861 Longitude: -89.56083)
Site 3 -SO_2 and Meteorology, (Latitude: 36.50889 Longitude: -89.57083)

2.4 Rider Trail I-70 Site

The department added an SO_2 monitor, designated as an SPM, to the existing Rider Trail I-70 monitoring site in May 2016 to evaluate SO_2 levels in the general area. Since installing the site, the annual fourth-highest daily one-hour SO_2 concentration has ranged from 12 to 23 ppb.

Since the monitor is in the near-roadway environment and is in an area with several SO_2 sources, the department initially classified the spatial scale of representativeness of the SO_2 measurements as middle-scale. The department may reevaluate this classification if trends in the monitoring data and other analyses warrant increasing the spatial scale of representativeness. The monitoring objective for this monitor is to measure population exposure.

3. National Air Toxics Trends Stations (NATTS), and Other Non-Criteria Pollutants Special Purpose Monitoring

3.1 National Air Toxics Trends Stations Monitoring

Routine NATTS monitoring will continue at Blair Street as described in the NATTS work plan. The department is also proposing to monitor air toxics in Kansas City for at least one year starting in mid- to late 2024 and to evaluate low-cost sensors for particulate matter and other pollutants at multiple sites in Missouri. These activities are funded under an Inflation Reduction Act Clean Air Grant awarded in 2023. The Kansas City air toxics monitoring will follow NATTS procedures but will not include monitoring of semi-volatile organics or black carbon.

3.2 Black Carbon

Black Carbon is monitored with an aethalometer at Blair Street. Also, as part of the condition of receiving one-time Section 103 grant funds to implement sites for the near-roadway monitoring network, the department will continue to conduct special purpose $PM_{2.5}$ black carbon monitoring at the Forest Park near-roadway site and will initiate black carbon monitoring at the new Kansas City area near-roadway site using aethalometers (see Section 7).

4. $PM_{2.5}$ Monitoring Network

4.1 $PM_{2.5}$ SLAMS Network

The minimum monitoring requirement based on population and past $PM_{2.5}$ measurements (40 C.F.R. § 58 Appendix D, Table D-5) requires three sites in the St. Louis area and three in the Kansas City area. St. Louis meets the requirement with four Missouri sites plus six Illinois sites in the St. Louis CBSA (in addition to the near-road sites). Kansas City meets the requirements with three Missouri sites plus two Kansas sites in the Kansas City CBSA (in addition to the near-road site).

There is one $PM_{2.5}$ monitor in Missouri that is not applicable for comparison to the annual NAAQS. The Branch Street site is a middle-scale site focused on a group of sources in the industrial riverfront area of St. Louis. This site is not representative of a neighborhood or larger spatial scale for $PM_{2.5}$ monitoring.

The $PM_{2.5}$ monitors deployed to collocate with the near-roadway NO_2 monitors are micro-scale monitors, but EPA has indicated in 40 C.F.R. § 58 Appendix D, 4.7.1(c)(2) that "In many situations, monitoring sites that are representative of microscale or middle-scale impacts are not unique and are representative of many similar situations. This can occur along traffic corridors or other locations in a residential district. In this case, one location is representative of a number of small-scale sites and is appropriate for evaluation of long-term or chronic effects." EPA may consider these monitors representative of larger areas near roadways and comparable to the annual $PM_{2.5}$ NAAQS consistent with 40 C.F.R. § 58.30.

The Hercules Glades and Mingo Interagency Monitoring of Protected Visual Environments (IMPROVE) sites meet the requirement for regional background $PM_{2.5}$ monitoring. In addition to these sites, the Arnold West and El Dorado Springs sites serve to monitor transport into eastern and western Missouri urban areas, respectively.

TEOM-1405-DFs and TEOM-1405-Fs are the primary FEM reporting instruments in the Missouri network for $PM_{2.5}$ measurement. However, the department does not report data from the PM_{10} FEM channels of the TEOM-1405-DF instruments to AQS.

Network $PM_{2.5}$ 1405-DF FEM/FRM collocation requirements are currently satisfied at the Blair Street NCore site in St. Louis. 1405-F colocation requirements are currently satisfied by the FRM sampler at Ladue.

The department has replaced the 1405-DF instruments in the network with 1405-Fs at all but two sites (Blair Street and Forest Park). The department has discontinued the Blue Ridge I-70 site and plans to install a new Kansas City area near-roadway site as soon as possible (see Section 7). EPA has made American Rescue Plan funds available that will be used to accelerate the equipment replacement cycle. The department currently plans to replace the 1405-DFs at Blair Street, Forest Park, and the Kansas City area near-roadway site with Teledyne API T640X instruments if updated firmware recently installed in T640X instruments proves to provide data comparable to FRM result. Otherwise, they will be replaced with new 1405-Fs. The T640X

instruments are more reliable and more economical to maintain, but $PM_{2.5}$ concentrations from the T640X have been biased compared to FRM sampler results, which was the reason for development by the instrument vendor and approval by EPA of updated firmware.

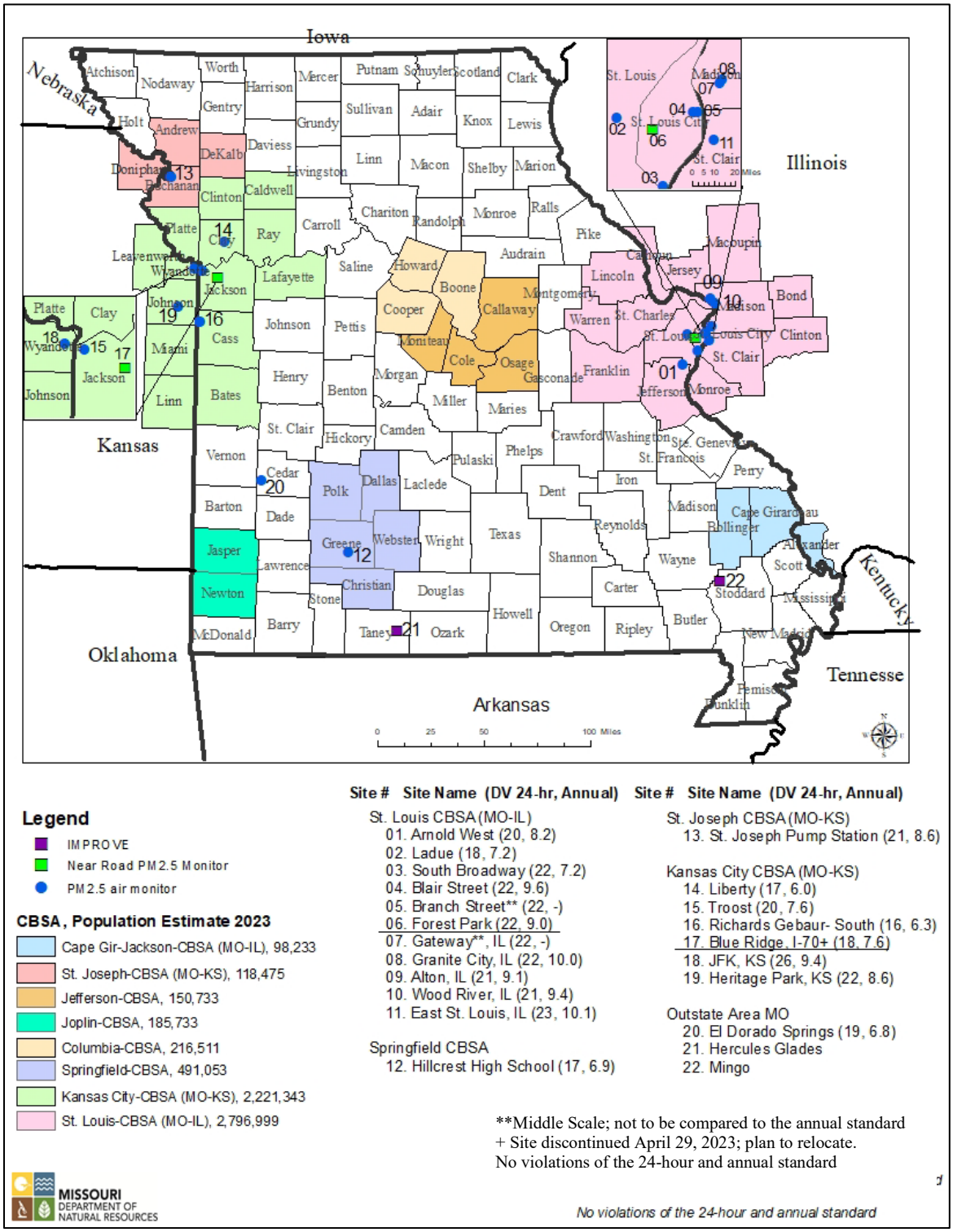
The department plans to replace aging 1405-Fs in the network with T640 instruments, starting with the Ladue and Liberty sites. The T640 is similar to the T640X, but measures only $PM_{2.5}$, not PM_{10}. As discussed above, this replacement is contingent on the adequacy of upgraded firmware for the T640; if upgraded firmware does not show comparability to FRM results, the replacement will be with new 1405-Fs.

Two TEOM-1405-F instruments are operated at the St. Joseph Pump Station site; one designated as primary, and one as collocated to satisfy the collocation requirement for that FEM method. The TEOM-1405-DF at Blair Street is currently designated as the primary $PM_{2.5}$ instrument at that site. The FRM $PM_{2.5}$ sampler at Blair Street will be the collocated FRM sampler for the new T640X (or 1405F) instruments. The department will designate the FRM $PM_{2.5}$ sampler at Ladue as the collocated FRM for the new T640 instruments or discontinue the FRM at Ladue if no T640s are installed.

The department is operating a Teledyne API T640X instrument at Blair Street and one at Troost and one at the Hillcrest High School site in Springfield as SPMs for PM_{10} measurement and to evaluate this instrument, which measures airborne particulate concentration using light scattering, for possible future use in the $PM_{2.5}$ network.

The department is also operating a Teledyne API T640, provided by EPA, at the Forest Park site in St. Louis. EPA is using data with a time resolution as short as one minute from that instrument and time-resolved data from the TEOM-1405-DF and meteorological instruments in non-parametric trajectory analysis (NTA), which uses high time-resolution $PM_{2.5}$ concentrations, other air quality data, and wind data to help identify source impacts. The department also provides time-resolved data to EPA from the Teledyne API T640X and other instruments at the Troost site in Kansas City.

2024 Missouri $PM_{2.5}$ Monitoring Network*, NAAQS=35 µg/m³ (24 hours), 9 µg/m³ (Annual). (Numbers in Parentheses are 2021-2023 Design Values for the 24-hour and Annual Standards)



*No changes to the $PM_{2.5}$ network are proposed in this plan, other than continuing replacement of aging samplers and relocation of the Kansas City area near-roadway site from Blue Ridge I-70 (see Section 7).

4.2 $PM_{2.5}$ Chemical Speciation Network (CSN)

The department conducts $PM_{2.5}$ speciation sampling at Blair Street in St. Louis (every three days) and at Arnold West (every six days).

4.3 $PM_{2.5}$ Section 103 Federal Funding

The department is not proposing any changes to the $PM_{2.5}$ monitoring network other than to continue to replace aging equipment and possibly discontinue the FRM sampler at Ladue as described previously. This plan, however, is contingent on EPA providing adequate grant funds to operate and maintain the $PM_{2.5}$ monitoring network.

40 C.F.R. § 58.14 (c) indicates, "State, or where appropriate, local agency requests for SLAMS monitor station discontinuation, subject to the review of the Regional Administrator, will be approved if any of the following criteria are met and if the requirements of appendix D to this part, if any, continue to be met. Other requests for discontinuation may also be approved on a case-by-case basis if discontinuance does not compromise data collection needed for implementation of a NAAQS and if the requirements of appendix D to this part if any, continue to be met." If reductions to the network become necessary, the department will provide written communication describing the network changes to the EPA Regional Administrator for review and approval, consistent with 40 C.F.R. § 58.14(b).

2024 Missouri $PM_{2.5}$ Monitoring Network

Site	Schedule*	Type	Agency	Purpose
St. Louis				
1.Blair St.	3	Collocated FRM	ESP	NCore and Quality Assurance
	3	Speciation	ESP	Chemical Speciation Network
	H	TEOM-1405-DF FEM	ESP	24 hr. & Annual NAAQS/AQI, NCore, PM10-2.5 continuous
	H	T640x PM Mass Monitor FEM	ESP	Method Performance Evaluation/Research. Not for NAAQS Compliance Determination
2.Branch St.	H	TEOM-1405-F FEM	ESP	24 hr. NAAQS/AQI (unique middle scale monitor†)
	H	T640x PM Mass Monitor FEM	ESP	Method Performance Evaluation/Research. Not for NAAQS Compliance Determination
3 Forest Park, I-64 (near-roadway)	H	TEOM-1405-DF FEM	ESP	24 hr. & Annual NAAQS/AQI, PM10-2.5 continuous (micro scale monitor)
	H	T640 PM Mass Monitor FEM	ESP	Method Performance Evaluation/Research. Not for NAAQS Compliance Determination
4.South Broadway	H	TEOM-1405-F FEM	ESP	24 hr. & Annual NAAQS/AQI
5.Ladue	H	TEOM-1405-F FEM	ESP	24 hr. & Annual NAAQS/AQI
	6	Collocated FRM	ESP	Quality Assurance
6.Arnold West	6	Speciation		Chemical Speciation Network
	H	TEOM-1405-F FEM	ESP	24 hr. & Annual NAAQS/AQI
Kansas City^				
7.Liberty	H	TEOM-1405-F FEM	ESP	24 hr. & Annual NAAQS/AQI
8.Troost	H	TEOM-1405-F FEM	ESP	24 hr. & Annual NAAQS/AQI
	H	Teledyne T640x FEM	ESP	Method Performance Evaluation/Research. Not for NAAQS Compliance Determination
10.Richards-Gebaur South	H	TEOM-1405-F FEM	ESP	24 hr. & Annual NAAQS/AQI
Springfield				
11.Hillcrest High School	H	TEOM-1405-F FEM	ESP	24 hr. & Annual NAAQS/AQI
	H	T640x PM Mass Monitor FEM	ESP	Method Performance Evaluation/Research. Not for NAAQS Compliance Determination
St. Joseph				
12.St. Joseph	H	TEOM-1405-F FEM	ESP	24 hr. & Annual NAAQS/AQI
	H	Collocated TEOM-1405-	ESP	Quality Assurance
Outstate				
13.El Dorado Springs	H	TEOM-1405-F FEM	ESP	24 hr. & Annual NAAQS/AQI
14. Mingo	3	IMPROVE	Fish & Wildlife Service	Chemical Speciation Network
15.Hercules Glades	3	IMPROVE	Forest Service	Chemical Speciation Network

*3= Every third day; 6= Every sixth day; H= Continuous monitoring, hourly data

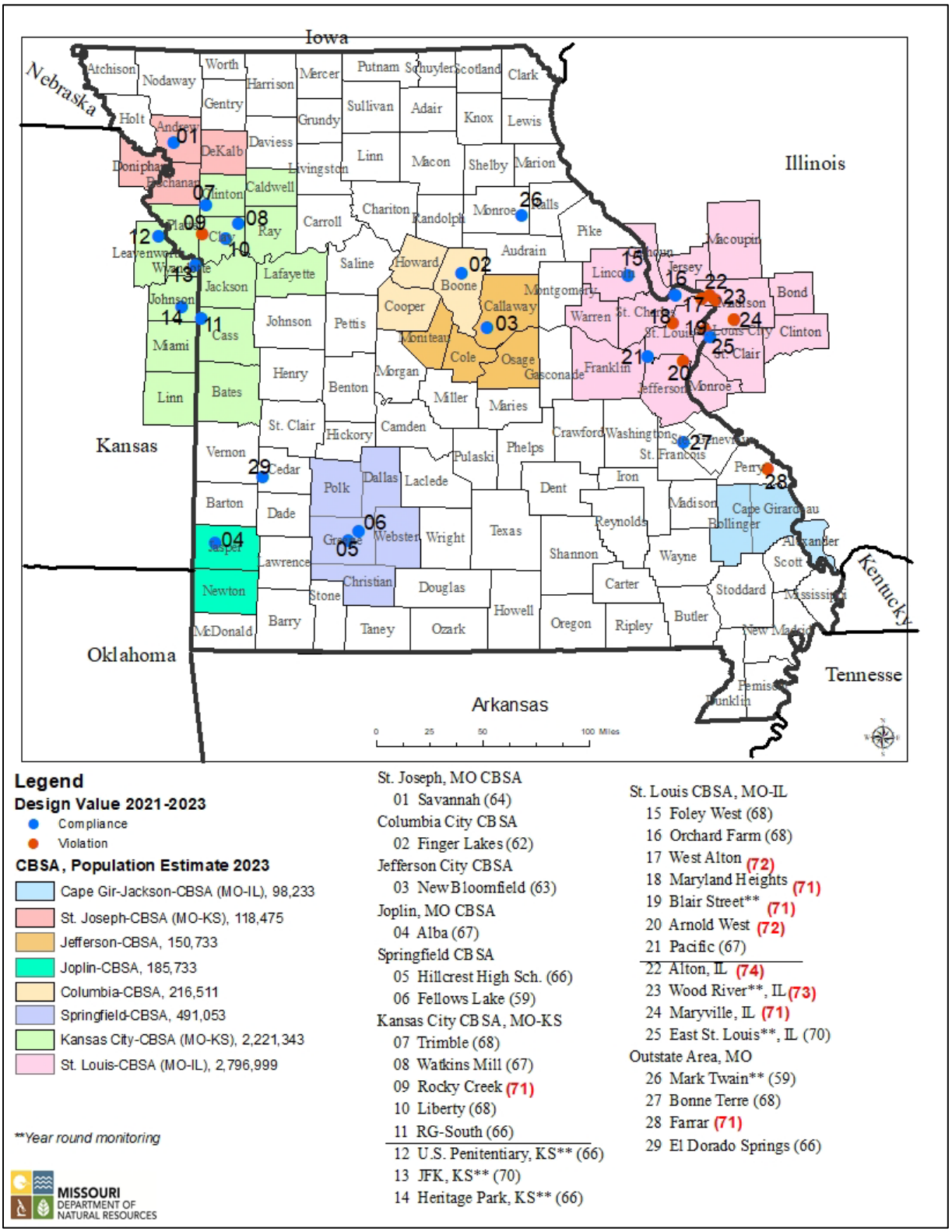
†The Branch St. Monitor is a unique middle scale impact site and not eligible for comparison to the Annual $PM_{2.5}$ NAAQS (40 CFR 58.30).

^9. Blue Ridge I-70 near roadway monitor has been discontinued.

5. Ozone Monitoring Network

The department is not planning any changes to the ozone monitoring network. Ozone monitoring will continue all year at the Mark Twain State Park (MTSP) site to collect ozone background concentrations needed for Prevention of Significant Deterioration (PSD) modeling projects and at Blair Street to meet the NCore ozone monitoring requirement. The current monitoring network meets the population-based requirements in 40 C.F.R § 58 Appendix D, which requires a minimum of two sites each in the St. Louis, Kansas City and Springfield areas.

2024 Missouri Ozone (O_3) Monitoring Network*, NAAQS=70 ppb (8 hour)
(Numbers in Parentheses are 2021-2023 Design Values)



*No changes to the O_3 network are proposed in this plan.

6. PM_{10} Monitoring Network

The department discontinued collocated FRM PM_{10} monitoring at Blair Street in St. Louis in February 2018. EPA no longer requires the collocation of the manual PM_{10} sampler (40 C.F.R. § 58 Appendix A, 3.3.4). The department designated the continuous PM_{10} from the Teledyne API T640X FEM monitor as primary and discontinued the primary FRM PM_{10} monitor at the site effective July 1, 2019. The Teledyne API T640X also reports PM_{Coarse} for the Blair NCore requirements.

The St. Louis CBSA includes four PM_{10} sites (not including the microscale Forest Park site), enough to meet the minimum monitoring requirement of four to eight sites based on our understanding of 40 C.F.R. § 58 Appendix D, 4.6, Table D-4. This monitor count includes the Granite City Fire Station site in Illinois, which the Illinois Environmental Protection Agency expects to continue operating based on communication with that agency. The department is currently awaiting a reply from EPA Region 7 as to whether additional PM_{10} monitoring is needed in the St. Louis CBSA to fulfill the minimum monitoring requirements.

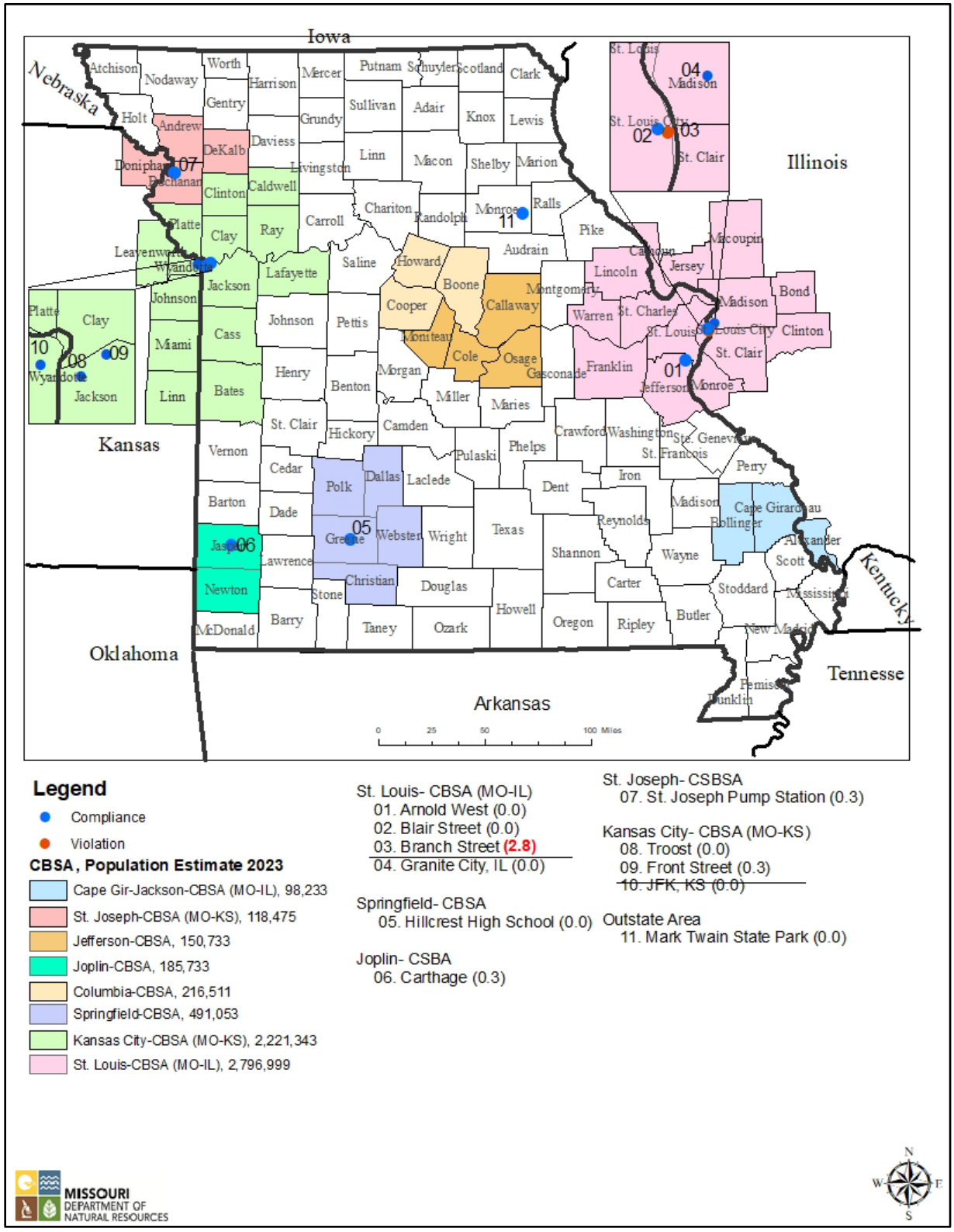
The PM_{10} monitors at Front Street in Missouri and JFK in Kansas meet the minimum monitoring requirement of two to four sites in the Kansas City CBSA. KDHE will continue monitoring PM_{10} at the JFK site, as confirmed by correspondence with KDHE staff, because it is an NCore site, as stated in the *2021 Kansas Air Monitoring Network Plan*.

In February 2019, the department began monitoring PM_{10} and $PM_{2.5}$ at Troost in Kansas City with a Teledyne API T640X instrument as an SPM for ongoing evaluation of the performance of that instrument. Similarly, in February 2022, the department began monitoring PM_{10} and $PM_{2.5}$ at Hillcrest High School in Springfield with a Teledyne API T640X instrument as an SPM for ongoing evaluation of the performance of that instrument.

The PM_{10} minimum monitoring requirement in the Springfield CBSA is zero to one, and monitoring at the Hillcrest High School site meets this requirement. The 2023 estimated population of the Springfield CBSA is 491,053. If this population increases to 500,000 or more, the minimum requirement will increase to one to two sites, and the Springfield CBSA will continue to meet the monitoring requirement.

The department installed a collocated PM_{10} TEOM-1400ab monitor at the Carthage site in April 2016 and will continue to operate it because of the importance of that site being near a source.

2024 Missouri PM_{10} Monitoring Network*, NAAQS=150 µg/m^3 (24 hour).
(Numbers in Parentheses are 2021-2023 Design Values)



*No changes to the PM_{10} network are proposed in this plan.

7. Nitrogen Dioxide (NO_2) Monitoring Network

The 2010 revisions to the NO_2 NAAQS required two near-road NO_2 monitoring sites in the St. Louis CBSA and one in the Kansas City CBSA. The department established the first St. Louis area site in January 2013, the Kansas City area site in July 2013 and the second near-roadway site in the St. Louis area in January 2015.

The first St. Louis area near-roadway site, Forest Park, is adjacent to I-64 west of downtown St. Louis. Air monitoring results at that site are consistent with commuter traffic, heaviest on weekday mornings. The second St. Louis area site, Rider Trail I-70, is adjacent to Interstate 70, just west of Interstate 270. Interstate 70 extends across the United States and carries through traffic in addition to commuter traffic and other local traffic. Therefore, the fleet mix and congestion patterns, relative to time of day and day of the week, are different than at the Forest Park site.

The department discontinued monitoring at the Kansas City area near-roadway site, Blue Ridge I-70 in May 2023 because of site security issues. The department plans to establish a new Kansas City area near-roadway site in mid- to late 2024. A site adjacent to I-435 in southern Kansas City has been proposed. Installation of that site is expected to be completed in 2024 pending completion of agreements with property owners. The department has kept EPA Region 7 staff informed during the site selection process and has secured approval from EPA of the proposed site.

The Troost site in Kansas City meets the requirement for community-wide monitoring in CBSAs with a population larger than 1 million (40 C.F.R. § 58 Appendix D, 4.3.3(a)). Blair Street meets the requirement in St. Louis. Both the Kansas City and St. Louis areas exceed the requirement with monitoring at the JFK site and East St. Louis site, respectively.

40 C.F.R. § 58, Appendix D, 4.3.4 includes the following additional requirement for NO_2 monitoring:

"4.3.4 Regional Administrator Required Monitoring

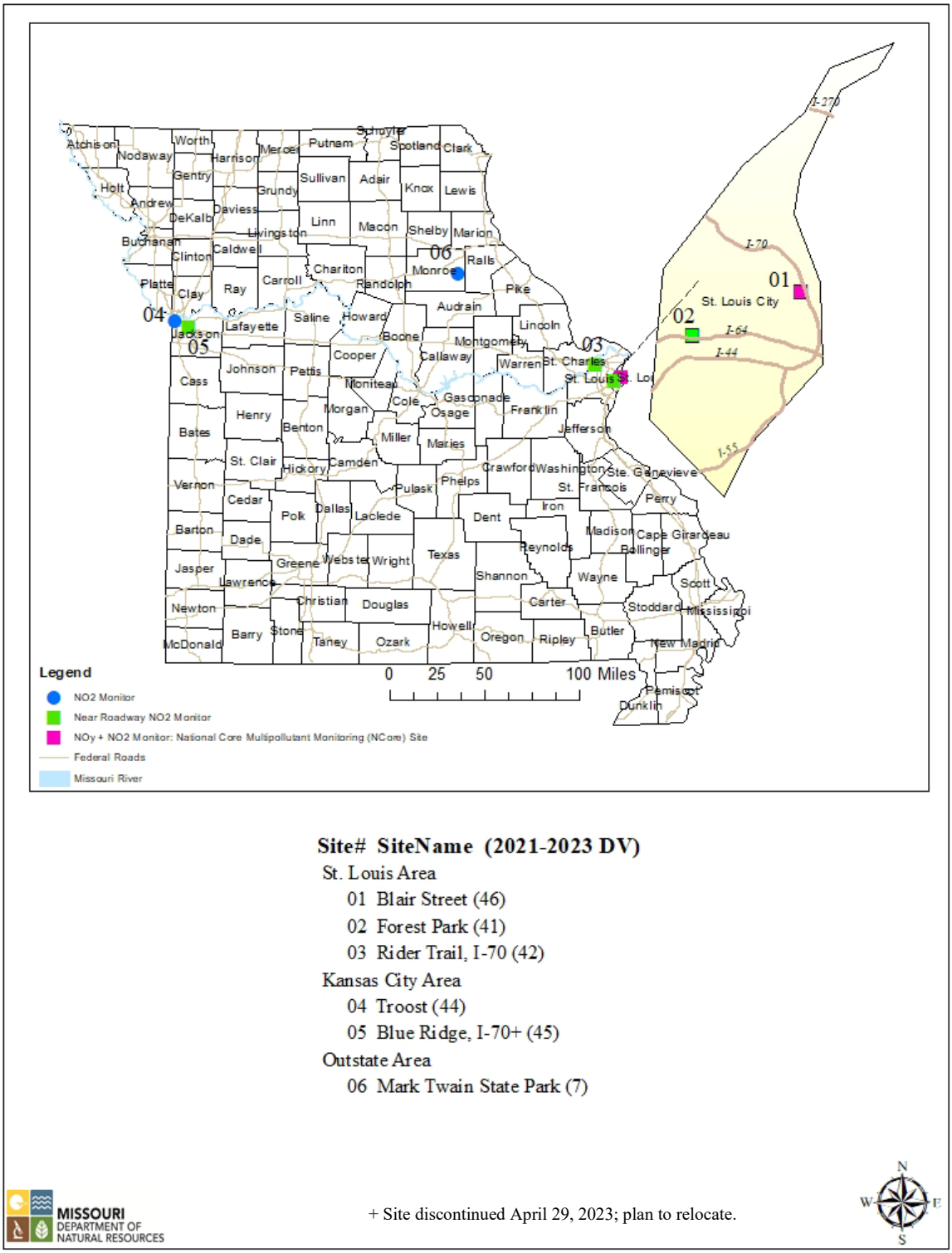
1. The Regional Administrators, in collaboration with States, must require a minimum of forty additional NO_2 monitoring stations nationwide in any area, inside or outside of CBSAs, above the minimum monitoring requirements, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations…."

The department discontinued NO_2 monitoring at the Margaretta site at the beginning of 2019 and requested that EPA designate Blair Street as a site located in an area where susceptible and vulnerable populations live, work and play, therefore meeting this requirement.

The department monitors NO_2 at the Blair Street site with a cavity attenuated phase shift (CAPS) $NO/NO_2/NO_X$ analyzer. The CAPS analyzer meets the requirement for True NO_2 monitoring as

part of the PAMS program (see Section 9) and supplement the required NO_y monitoring at the Blair Street NCore site.

2024 Missouri Nitrogen Dioxide (NO_2) Monitoring Network*, NAAQS=100 ppb (1 hour). (Numbers in Parentheses are 2021-2023 Design Values)



Site# SiteName (2021-2023 DV)

St. Louis Area
- 01 Blair Street (46)
- 02 Forest Park (41)
- 03 Rider Trail, I-70 (42)

Kansas City Area
- 04 Troost (44)
- 05 Blue Ridge, I-70+ (45)

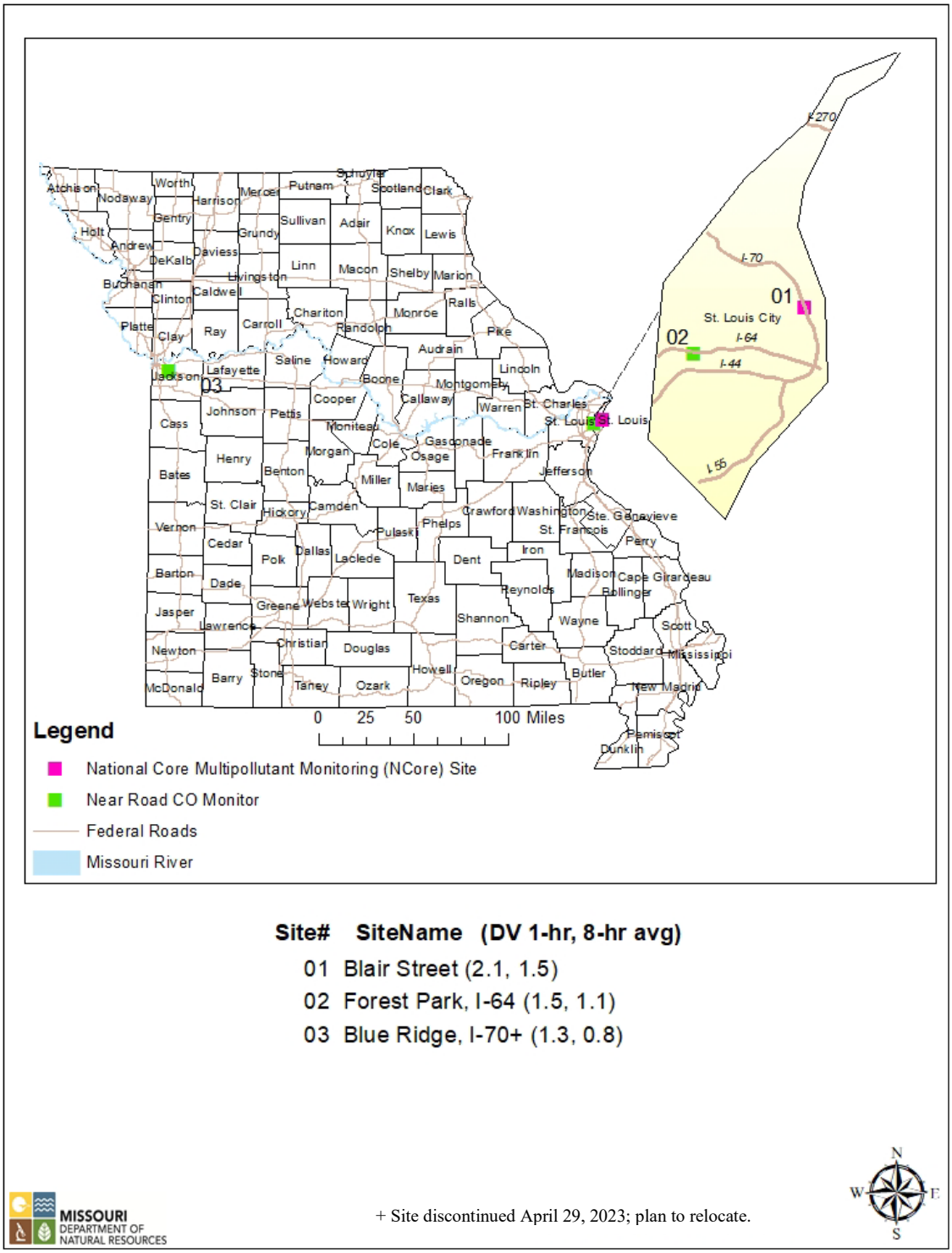
Outstate Area
- 06 Mark Twain State Park (7)

*The Blue Ridge I-70 site will be replaced by a new Kansas City area near-roadway site. No other changes to the NO_2 network are proposed in this plan.

8. Carbon Monoxide (CO) Monitoring Network

The 2013 NAAQS rule for CO requires near-road CO monitoring at one site in the St. Louis CBSA. The department established CO monitoring sites at the same time as the NO_2 monitoring sites at the Forest Park I-40/64 and Blue Ridge I-70 near-roadway monitoring sites. The department discontinued monitoring at the Blue Ridge I-70 in May 2023 because of site security issues. The department plans to establish a new Kansas City area near-roadway site in 2024 (see Section 7). The department is not proposing any other changes to the CO monitoring network in this plan.

2024 Missouri Carbon Monoxide (CO) Monitoring Network*, NAAQS=35 ppm (1 hour), 9 ppm (8 hour). (Numbers in Parentheses are 2021-2023 Design Values for the 1-hour and 8-hour Standards)



*The Blue Ridge I-70 site will be replaced by a new Kansas City area near-roadway site. No other changes to the CO network are proposed in this plan.

9. Photochemical Assessment Monitoring Station

In previous versions of the Monitoring Network Plan, this section served as the Photochemical Assessment Monitoring Station (PAMS) Implementation Plan. PAMS monitoring began in June 2021. This section now describes an ongoing program.

9.1 Introduction: Regulatory Requirements and Guidance Documents

The "National Ambient Air Quality Standards for Ozone; Final Rule," (*Federal Register*, volume 80, number 206, Oct. 26, 2015), included amendment of 40 C.F.R. § 58, Appendix D (5) to include the following:

> "5. NETWORK DESIGN FOR PHOTOCHEMICAL ASSESSMENT MONITORING STATIONS (PAMS) AND ENHANCED OZONE MONITORING
>
> 1. State and local monitoring agencies are required to collect and report PAMS measurements at each NCore site required under paragraph 3(a) of this appendix located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures.
>
> 2. PAMS measurements will include:
>
> (1) Hourly averaged speciated volatile organic compounds (VOCs);
> (2) Three 8-hour averaged carbonyl samples per day on a 1 in 3 day schedule, or hourly averaged formaldehyde;
> (3) Hourly averaged O_3;
> (4) Hourly averaged nitrogen oxide (NO), true nitrogen dioxide (NO_2), and total reactive nitrogen (NO_y);
> (5) Hourly averaged ambient temperature;
> (6) Hourly vector-averaged wind direction;
> (7) Hourly vector-averaged wind speed;
> (8) Hourly average atmospheric pressure;
> (9) Hourly averaged relative humidity;
> (10) Hourly precipitation;
> (11) Hourly averaged mixing-height;
> (12) Hourly averaged solar radiation; and
> (13) Hourly averaged ultraviolet radiation…
>
> (g) At a minimum, the monitoring agency shall collect the required PAMS measurements during the months of June, July and August."

The same rule included amendment of 40 C.F.R. § 58.10 (a) (10) to include the following:

> "A plan for making Photochemical Assessment Monitoring Stations (PAMS) measurements, if applicable, in accordance with the requirements of appendix D paragraph 5(a) of this part shall be submitted to the EPA Regional Administrator no later

than July 1, 2018. The plan shall provide for the required PAMS measurements to begin by June 1, 2019."

Primarily because of delays in national procurement of some of the required equipment for PAMS measurement, EPA revised this regulation to change the required start date for PAMS measurement to June 1, 2021 (*Federal Register*, volume 85, number 5, Jan. 8, 2020, page 834).

EPA has published a guidance document entitled *PAMS Required Sites Quality Assurance Implementation Plan [QAIP],* October 2016. The QAIP provides guidance for both EPA and monitoring organizations in implementation of the above-referenced PAMS requirements. The QAIP includes the following recommendations:

> "Monitoring organization PAMS Implementation Plan: The monitoring organization Implementation Plan document will specify how the monitoring organization will perform the measurements for the Required Network. The plan will include details on activities such as monitoring site location, costs and schedule of events, among other information. The plan will also include any waivers to siting or monitoring methods." (Page 13).
>
> "Monitoring organizations should have their PAMS waivers and Required Network Implementation Plans finalized by July 2017 and must have them completed by the end of October 2017.[20]
>
> [20] The regulation requires that monitoring organization Required Network Ips be developed in their Annual Network Plans due July 2018. However, in order to be operational by June 2019, it would be beneficial to have plans finalized by the end of October 2017." (Page 21).

EPA provided additional guidance including a PAMS Technical Assistance Document (TAD), finalized in 2019, and a national QAPP, finalized in 2020, and draft standard operating procedures for PAMS instrument systems. EPA updated the PAMS TAD and national QAPP in May 2023. EPA also conducts monthly conference calls to disseminate information and guidance on PAMS monitoring.

Section 9 of the 2018 (and 2019 and 2020) Monitoring Network Plan(s) fulfilled the regulatory requirement in 40 C.F.R. § 58.10 (a) (10) for submittal of a PAMS Implementation Plan by July 2018. The 2017 Monitoring Network Plan included an early version of the plan to meet the recommended schedule in the QAIP for submittal by July 2017 in advance of the regulatory requirement. The department completed a QAPP for the PAMS project based on the national QAPP in 2021 and updated that QAPP in 2022, 2023 and 2024.

9.2 PAMS Measurements

The department conducts PAMS monitoring at the Blair Street Station in St. Louis. The Blair Street Station is an NCore site in a CBSA with a population of greater than 1 million. The JFK site in Kansas City, Kansas is the NCore site and PAMS site in the Kansas City CBSA according to the *2021 Kansas Air Monitoring Network Plan*. PAMS monitoring began at Blair Street in 2021. As long as the regulatory requirements are in place and funding is available to support this

activity, monitoring will continue during the months of June, July and August each year. The department will report data from PAMS monitoring to EPA's AQS database except for carbonyl and mixing height data as noted below.

The department has not requested any of the waivers from EPA described in 40 C.F.R. § 58, Appendix D (5) (c) through (f).

Each of the required measurements in 40 C.F.R. § 58, Appendix D (5) (b) is discussed below.

9.2.1. Hourly Averaged Speciated Volatile Organic Compounds (VOCs)

EPA evaluated several gas chromatographs (GC) designed to measure concentrations of hourly average speciated VOCs. EPA contracted with two of the vendors of these GC systems to provide instruments to each monitoring organization required to conduct PAMS monitoring. The department selected the Consolidated Analytical Systems (CAS)/Chromatotec AirmOzone Auto-Gas Chromatograph with Flame Ionization Detection. The department received and installed the GC in fall 2020.

The following Revised PAMS Target List lists target compounds for this measurement (carbonyl compounds included in the table are measured in samples described under 9.2.2 below).

9.2.2 Three 8-hour Averaged Carbonyl Samples per Day on a 1 in 3 Day Schedule, or Hourly Averaged Formaldehyde

The department operates a sampler capable of collecting multiple 8-hour samples using derivatized sorbent tubes according to EPA method TO-11A. Analysis of TO-11A samples for the carbonyls listed in the following table (identified by footnote b) is being made available by EPA using its national contract analytical laboratory. The contract laboratory will also enter the carbonyl data into EPA's AQS database.

9.2.3 Hourly Averaged O_3

Hourly averaged ozone is measured at Blair Street as a part of the NCore requirements (see Section 5).

Revised PAMS Target List[a]

From EPA Memorandum, Oct. 2, 2017, "Additional Revisions to the Photochemical Assessment Monitoring Stations Compound Target List"

Existing Priority Compounds	Optional Compounds
1,2,3-Trimethylbenzene	1,3 Butadiene
1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
1-Butene	1-Pentene
2,2,4-Trimethylpentane	2,2-Dimethylbutane
Acetaldehyde[b]	2,3,4-Trimethylpentane
Benzene	2,3-Dimethylbutane
Cis-2-Butene	2,3-Dimethylpentane
Ethane	2,4-Dimethylpentane
Ethylbenzene	2-Methylheptane
Ethylene	2-Methylhexane
Formaldehyde[b]	2-Methylpentane
Isobutane	3-Methylheptane
Isopentane	3-Methylhexane
Isoprene	3-Methylpentane
M/P Xylene	Acetone
M-Ethyltoluene	Acetylene
N-Butane	Alpha Pinene
N-Hexane	Benzaldehyde[b]
N-Pentane	Beta Pinene
O-Ethyltoluene	Cis-2-Pentene
O-Xylene	Carbon Tetrachloride
P-Ethyltoluene	Cyclohexane
Propane	Cyclopentane
Propylene	Ethanol
Styrene	Isopropylbenzene
Toluene	M-Diethylbenzene
Trans-2-Butene	Methylcyclohexane
	Methylcyclopentane
	N-Decane
	N-Heptane
	N-Nonane
	N-Octane
	N-Propylbenzene
	N-Undecane
	P-Diethylbenzene
	Tetrachloroethylene
	Trans-2-Pentene

[a] This table only includes individual target compounds. Monitoring agencies should continue measuring and reporting total non-methane organic compounds (TNMOC)

[b] These compounds are carbonyls and are measured using Method TO-11a

9.2.4 Hourly Averaged Nitrogen Oxide (NO), True Nitrogen Dioxide (NO_2) and Total Reactive Nitrogen (NO_y)

NO and NO_y are measured at Blair Street as a part of the NCore requirements. The department replaced the photolytic NO_2 instrument at Blair Street in June 2022 with a cavity attenuated phase shift spectroscopy (CAPS) $NO/NO_2/NO_X$ analyzer designated as FEM that will provide NO and Nox in addition to the true NO_2 measurement.

9.2.5-9.2.10 Hourly Averaged Ambient Temperature, Hourly Vector-Averaged Wind Direction, Hourly Vector-Averaged Wind Speed, Hourly Averaged Atmospheric Pressure, Hourly Averaged Relative Humidity, and Hourly Precipitation

The department measures temperature, wind direction, wind speed, atmospheric pressure, relative humidity and precipitation at Blair Street.

9.2.11 Hourly Averaged Mixing Height

EPA provided funding for the procurement of a ceilometer, which is an instrument that uses a laser to measure mixing height. The department operates a Vaisala CL-51 ceilometer at the Blair Street site. The department will transfer data from the ceilometer to the Unified Ceilometer Network (UCN) operated by Hampton University and the University of Maryland, Baltimore County. The UCN processes ceilometer data and will input mixing height data into EPA's AQS database.

9.2.12 Hourly Averaged Solar Radiation

Solar radiation is measured at Blair Street.

9.2.13 Hourly Averaged Ultraviolet Radiation

The department operates an ultraviolet radiation measurement instrument at Blair Street.

Network Description/Components

See Appendix 1 for the Network Description, which includes the following components:

Site Data

All ambient air monitoring sites are recorded in the EPA's AQS database. Site data include:

AQS Site Code

The site code includes a numerical designation for state, county and individual site. The state and county codes are assigned a number based on the alphabetical order of the state or county. In most counties, site numbers are assigned sequentially by date established. St. Louis County sites also have a division for municipality within St. Louis County.

Street Address

The official post office address of the lot where the monitors are located. Because not all sites are located in cities or towns, the street address is occasionally given as the intersection of the nearest streets or highways.

Geographical Coordinates

The coordinate system used by the department is latitude and longitude.

Air Quality Control Region

Air Quality Control Regions (AQCR) are defined by EPA and designate either urban regions, like St. Louis or Kansas City, or rural sections of a state, such as northeast or southwest Missouri.

AQCR	AQCR Name
070	Metropolitan St. Louis
094	Metropolitan Kansas City
137	Northern Missouri
138	Southeast Missouri
139	Southwest Missouri

Core Based Statistical Area

Core Based Statistical Areas (CBSA) are defined by the U.S. Census Bureau.

CBSA Code	CBSA Name
00000	Not in a CBSA
16020	Cape Girardeau-Jackson, Missouri-Illinois
17860	Columbia
27620	Jefferson City
27900	Joplin
28140	Kansas City, Missouri-Kansas
41140	St. Joseph, Missouri-Kansas
41180	St. Louis, Missouri-Illinois
44180	Springfield

Monitor Data

Each monitor is designed to detect a specific chemical pollutant or group of related pollutants. A site may have one or many monitors and not all sites will have the same monitors. Monitor data include:

Pollutant

The common name of the pollutant. Criteria pollutants are defined by statute in the Clean Air Act.

AQS Pollutant Code

Each pollutant has a unique numerical code. PAMS pollutant codes are listed in the PAMS QAPP.

Pollutant Code	Pollutant
14129	Lead – Local Conditions (LC)
42101	Carbon Monoxide
42401	Sulfur Dioxide
42406	Sulfur Dioxide 5-minute
42600	Reactive Oxides of N (NO_y)
42601	Nitric Oxide
42602	Nitrogen Dioxide
42603	Oxides of Nitrogen
44201	Ozone
61103	Resultant Wind Speed
61104	Resultant Wind Direct
62101	Outdoor Temperature
62107	Indoor Temperature
62201	Relative Humidity
63301	Solar Radiation
63302	Ultraviolet Radiation
64101	Barometric Pressure
68105	Average Ambient Temperature
68108	Sample Barometric Pressure
81102	PM_{10}
88313	Black Carbon-LC
85101	PM_{10} – LC
85129	Lead PM10 LC - FRM/FEM
86101	PMCoarse – LC (FRM Difference)
88101	$PM_{2.5}$ FRM
88500	$PM_{2.5}$ Total Atmospheric
88502	$PM_{2.5}$ AQI/Speciation
88503	$PM_{2.5}$ Reference
61106	Sigma Theta
62106	Temperature Difference
65102	Precipitation
88314	UV Carbon $PM_{2.5}$-Local Condition

85102	Antimony
85103	Arsenic PM_{10} LC
85107	Barium PM_{10} LC
85109	Bromine PM_{10} LC
85110	Cadmium PM_{10} LC
85111	Calcium PM_{10} LC
85112	Chromium PM_{10} LC
85113	Cobalt PM_{10} LC
85114	Copper PM_{10} LC
85126	Iron PM_{10} LC
85128	Lead PM_{10} LC
85132	Manganese PM_{10} LC
85136	Nickel PM_{10} LC
85142	Mercury PM_{10} LC
85154	Selenium PM_{10} LC
85160	Tin PM_{10} LC
85161	Titanium PM_{10} LC
85164	Vanadium PM_{10} LC
85166	Silver PM_{10} LC
85167	Zinc PM_{10} LC
85173	Thallium PM_{10} LC
85180	Potassium PM_{10} LC
88160	Tin PM_{10} LC
	Organic Carbon Chemical Speciation Network Unadjusted
88305	$PM_{2.5}$ LC TOT
88312	Total Carbon $PM_{2.5}$ LC TOT
88316	Optical Elemental Carbon $PM_{2.5}$ LC TOT

Parameter Occurrence Code

The Parameter Occurrence Code (POC) distinguishes between different monitors for the same pollutant, most often collocated monitors used for precision and quality assurance. For $PM_{2.5}$, different parameter occurrence codes are assigned to FRM, collocated FRM, continuous and speciation monitors.

Collocated

Collocated monitors are used for precision and quality assurance activities, and for redundancy for critical pollutants such as ozone.

Sampling Frequency

Sampling frequency varies for each pollutant, depending on the nature of the NAAQS and the technology used in the monitoring method. Most gaseous pollutants, $PM_{2.5}$ and PM_{10} monitors use continuous monitoring FEM methods and are averaged over one hour. Some particulate pollutants are filter-based FRM methods and averaged over one day.

Scale of Representation

Each monitor is intended to represent an area with similar pollutant concentration. The scales range from only a few meters to many kilometers.

- **MIC** **Microscale** - Defines the concentration in air volumes associated with area dimensions ranging from several meters up to about 100 meters.
- **MID** **Middle** - Defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.
- **NBR** **Neighborhood** - Defines concentrations within an extended area of a city that has relatively uniform land use with dimensions of 0.5 to 4.0 kilometers.
- **URB** **Urban** - Defines an overall citywide condition with dimensions on the order of 4 to 50 kilometers.
- **REG** **Regional** - Defines air quality levels over areas having dimensions of 50 to hundreds of kilometers.

Monitor Type/Network Affiliation

The monitor's administrative classification is determined by the purpose for the monitor in the agency sampling strategy. Assignment of monitor types “NCORE” and “PAMS” is limited to EPA headquarters and is done only after a complete review and approval for all site or monitor metadata.

Code	Description
IMPROVE	IMPROVE or IMPROVE Protocol
INDEX SITE	(not currently used by Missouri)
INDUSTRIAL	Used to indicate sites operated by an industry Primary Quality Assurance Organization (PQAO)
NATTS	National Air Toxics Trends Station
NEAR ROAD	Near Road monitoring station
NCORE	National Core monitoring station
NON-EPA FEDERAL	(not currently used by Missouri)
NON-REGULATORY	Not used for NAAQS compliance
PAMS	Photochemical Assessment Monitoring Stations
PROPOSED NCORE	Proposed NCore
QA COLLOCATED	Collocated to Satisfy 40 C.F.R 58 Appendix A
SLAMS	State or Local Air Monitoring Station
SPECIAL PURPOSE	Special Purpose Monitoring Station (SPM or SPMS)
SUPLMNTL SPECIATION	Supplemental Speciation
TRENDS SPECIATION	Trends Speciation
TRIBAL MONITORS	(not currently used by Missouri)
UNOFFICIAL PAMS	(not currently used by Missouri)

State Monitoring Objective

Each monitor has a distinct objective such as providing real-time data for public awareness or use in determining compliance with regulations. The state monitoring objective provides more information about the purpose of the monitoring in addition to the monitor objective required of 40 C.F.R. § 58.10(a)(6).

State Objective Code	Objective
AQI	Public Information
COM	NAAQS Compliance
MET	Meteorological Data
RES	Research
SIP	State Implementation Plan
SPP	Special Purpose Project
STA	State Standard

Units

The physical terms used to quantify the pollutant concentration, such as parts per million or micrograms per cubic meter.

Unit Code	Unit Description
001	$\mu g/m^3$
007	parts per million
008	parts per billion
011	meters per second
012	miles per hour
013	knots
014	degree, compass
015	degree Fahrenheit
016	millibars
017	degree Celsius
018	Langleys
019	percent humidity
021	inches
022	inches Mercury
025	Langleys per minute
059	Millimeter (Mercury)
073	Liters/minute STP-Flow
077	Micrograms
079	$Watts/m^2$
083	Cubic meter/minute
105	$\mu g/m^3$ LC
106	Minutes
107	Percent
118	Liters/minute LC-Flow
119	Cubic meters/minute LC-Flow
121	parts per trillion

Monitoring/Analytical Method

Each monitor relies on a scientific principle to determine the pollutant concentration, which is described by the sampling method. Each method code is specific for a particular pollutant; therefore, a three numeral code may be used for different methods for different pollutants. This is required by 40 C.F.R. § 58.10(a)(3).

Monitoring Objective

This is the primary monitoring objective(s) for the monitoring parameter required by 40 C.F.R. § 58.10(a)(6). The monitoring objective is specific to the pollutant. Some sites may have more than one monitoring objective, but the primary objective is listed first.

Appendix 1: Missouri Monitoring Network Description

Missouri Ambient Air Monitoring Network

MIC	***Microscale (Several meters up to about 100 meters)***
MID	***Middle (100 meters to 0.5 kilometer)***
NBR	***Neighborhood (0.5 to 4.0 kilometers range)***
URB	***Urban (4 to 50 kilometers)***
REG	***Regional (Tens to hundreds of kilometers)***
COM	***National Ambient Air Quality Standards (NAAQS) Compliance***
MET	***Meteorological Data***
N/A	***Not Applicable***
NCore	***National Multi-Pollutant Monitoring Stations***
NON-A	***Non-Ambient Site***
NON-R	***Non-Regulatory***
PQAO	***Primary Quality Assurance Organization***
RES	***Research***
SLAMS	***State and Local Monitoring Stations***
SIP	***State Implementation Plan***
SPEC	***Speciation***
STA	***State Standard***
SPM	***Special Purpose Monitoring***
SPP	***Special Purpose Project***
Coll	***Collocated monitor. A secondary monitor at a site.***
PAMS	***Photochemical Assessment Monitoring Stations***

Ameren Missouri (PQAO - 1440)

Labadie "Plant" Site — *AQS Site Number* 29-071-9003

~1.5 km south of the Labadie Energy Center, Labadie, MO 63055

Latitude: 38.5486 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.83725 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 680

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Std Dev Hz Wind Direction	61106	Industrial	1	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (40m)
Std Dev Hz Wind Direction	61106	Industrial	2	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (60m)
Std Dev Hz Wind Direction	61106	Industrial	3	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (80m)
Std Dev Hz Wind Direction	61106	Industrial	4	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (100m)
Std Dev Hz Wind Direction	61106	Industrial	5	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (120m)
Std Dev Hz Wind Direction	61106	Industrial	6	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (140m)
Std Dev Hz Wind Direction	61106	Industrial	7	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (160m)

Std Dev Hz Wind Direction	61106	Industrial	8	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (180m)
Std Dev Hz Wind Direction	61106	Industrial	9	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (200m)
Std Dev Hz Wind Direction	61106	Industrial	10	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (220m)
Std Dev Hz Wind Direction	61106	Industrial	11	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (240m)
Std Dev Hz Wind Direction	61106	Industrial	12	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (260m)
Std Dev Hz Wind Direction	61106	Industrial	13	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (280m)
Std Dev Hz Wind Direction	61106	Industrial	14	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (300m)
Temperature Virtual	62102	Industrial	1	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (40m)
Temperature Virtual	62102	Industrial	2	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (60m)
Temperature Virtual	62102	Industrial	3	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (80m)
Temperature Virtual	62102	Industrial	4	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (100m)

Temperature Virtual	62102	Industrial	5	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (120m)
Temperature Virtual	62102	Industrial	6	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (140m)
Temperature Virtual	62102	Industrial	7	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (160m)
Temperature Virtual	62102	Industrial	8	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (180m)
Temperature Virtual	62102	Industrial	9	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (200m)
Temperature Virtual	62102	Industrial	10	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (220m)
Temperature Virtual	62102	Industrial	11	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (240m)
Temperature Virtual	62102	Industrial	12	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (260m)
Temperature Virtual	62102	Industrial	13	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (280m)
Temperature Virtual	62102	Industrial	14	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (300m)

Wind Direction - Resultant	61104	Industrial	1	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (40m)
Wind Direction - Resultant	61104	Industrial	2	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (60m)
Wind Direction - Resultant	61104	Industrial	3	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (80m)
Wind Direction - Resultant	61104	Industrial	4	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (100m)
Wind Direction - Resultant	61104	Industrial	5	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (120m)
Wind Direction - Resultant	61104	Industrial	6	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (140m)
Wind Direction - Resultant	61104	Industrial	7	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (160m)
Wind Direction - Resultant	61104	Industrial	8	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (180m)
Wind Direction - Resultant	61104	Industrial	9	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (200m)
Wind Direction - Resultant	61104	Industrial	10	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (220m)
Wind Direction - Resultant	61104	Industrial	11	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (240m)

Wind Direction - Resultant	61104	Industrial	12	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (260m)
Wind Direction - Resultant	61104	Industrial	13	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (280m)
Wind Direction - Resultant	61104	Industrial	14	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (300m)
Wind Speed - Resultant	61103	Industrial	1	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (40m)
Wind Speed - Resultant	61103	Industrial	2	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (60m)
Wind Speed - Resultant	61103	Industrial	3	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (80m)
Wind Speed - Resultant	61103	Industrial	4	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (100m)
Wind Speed - Resultant	61103	Industrial	5	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (120m)
Wind Speed - Resultant	61103	Industrial	6	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (140m)
Wind Speed - Resultant	61103	Industrial	7	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (160m)
Wind Speed - Resultant	61103	Industrial	8	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (180m)

Wind Speed - Resultant	61103	Industrial	9	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (200m)
Wind Speed - Resultant	61103	Industrial	10	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (220m)
Wind Speed - Resultant	61103	Industrial	11	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (240m)
Wind Speed - Resultant	61103	Industrial	12	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (260m)
Wind Speed - Resultant	61103	Industrial	13	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (280m)
Wind Speed - Resultant	61103	Industrial	14	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (300m)
WS - Sigma Theta (Vertical)	61110	Industrial	1	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (40m)
WS - Sigma Theta (Vertical)	61110	Industrial	2	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (60m)
WS - Sigma Theta (Vertical)	61110	Industrial	3	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (80m)
WS - Sigma Theta (Vertical)	61110	Industrial	4	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (100m)

WS - Sigma Theta (Vertical)	61110	Industrial	5	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (120m)
WS - Sigma Theta (Vertical)	61110	Industrial	6	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (140m)
WS - Sigma Theta (Vertical)	61110	Industrial	7	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (160m)
WS - Sigma Theta (Vertical)	61110	Industrial	8	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (180m)
WS - Sigma Theta (Vertical)	61110	Industrial	9	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (200m)
WS - Sigma Theta (Vertical)	61110	Industrial	10	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (220m)
WS - Sigma Theta (Vertical)	61110	Industrial	11	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (240m)
WS - Sigma Theta (Vertical)	61110	Industrial	12	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (260m)
WS - Sigma Theta (Vertical)	61110	Industrial	13	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (280m)
WS - Sigma Theta (Vertical)	61110	Industrial	14	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (300m)

Labadie, North

AQS Site Number 29-183-9004

~150 ft. north of Terry Rd and ~200 ft. Kingfisher Ct, Augusta, MO 63332

Latitude: 38.59557 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.82864 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 816

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented

Labadie, Northwest

AQS Site Number 29-183-9002

Rt. 94, Augusta, MO 63332 near the intersection with Schluersburg Road

Latitude: 38.5818 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.865528 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 550

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Outdoor Temperature	62101	Industrial	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	Industrial	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	Industrial	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (10m - 2m Probe Heights)

Relative Humidity	62201	Industrial	1	☐	1	N/A	MET	019	%humidity	061	Met One 083D	Other
Std Dev Hz Wind Direction	61106	Industrial	1	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (10m Tower)
Std Dev Vt Wind Direction	61107	Industrial	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Wind Direction - Resultant	61104	Industrial	1	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (10m Tower)
Wind Direction - Scalar	61102	Industrial	1	☐	1	N/A	MET	014	deg	063	Climatronics	Other (10m Tower)
Wind Speed - Resultant	61103	Industrial	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (10m Tower)
Wind Speed - Scalar	61101	Industrial	1	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (10m Tower)

Wind Speed - Vertical	61109	Industrial	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (10m Tower)
WS - Sigma Theta (Vertical)	61110	Industrial	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (10m Tower)

Labadie, Southwest — *AQS Site Number* 29-071-9002

870 Albertina Lane, Labadie, MO 63055

Latitude: 38.52825 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.86301 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 630

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented

Labadie, Valley Site — *AQS Site Number* 29-071-9001

2901 Labadie Bottom Road, Labadie, MO 63055

Latitude: 38.572522 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.796911 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 525

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	Industrial	1	☐	1	N/A	MET	016	Millbars	015	Instrumental-Barometric Press Transducer	Other

Outdoor Temperature	62101	Industrial	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	Industrial	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	Industrial	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (10m - 2m Probe Heights)
Precipitation	65102	Industrial	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	Other
Relative Humidity	62201	Industrial	1	☐	1	N/A	MET	019	%humidity	061	Met One 083D	Other
Solar Radiation	63301	Industrial	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	Industrial	1	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (10m Tower)
Std Dev Vt Wind Direction	61107	Industrial	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented

Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Wind Direction - Resultant	61104	Industrial	1	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (10m Tower)
Wind Direction - Scalar	61102	Industrial	1	☐	1	N/A	MET	014	deg	063	Climatronics	Other (10m Tower)
Wind Speed - Resultant	61103	Industrial	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (10m Tower)
Wind Speed - Scalar	61101	Industrial	1	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (10m Tower)
Wind Speed - Vertical	61109	Industrial	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (10m Tower)
WS - Sigma Theta (Vertical)	61110	Industrial	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (10m Tower)

Rush Island, Fults-Site, IL — *AQS Site Number* 17-133-9001

Off Ivy Road, Fults, IL 62244

Latitude: 38.15908 ***AQCR:*** 138 SE Missouri

Longitude: -90.22728 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 446

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Barometric Pressure	64101	Industrial	1	☐	1	N/A	MET	016	Millbars	015	Instrumental-Barometric Press Transducer	Other
Outdoor Temperature	62101	Industrial	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	Industrial	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	Industrial	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (10m - 2m Probe Heights)
Precipitation	65102	Industrial	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	Other
Relative Humidity	62201	Industrial	1	☐	1	N/A	MET	019	%humidity	061	Met One 083D	Other
Solar Radiation	63301	Industrial	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	Industrial	1	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (10m Tower)
Std Dev Vt Wind Direction	61107	Industrial	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)

Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Wind Direction - Resultant	61104	Industrial	1	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (10m Tower)
Wind Direction - Scalar	61102	Industrial	1	☐	1	N/A	MET	014	deg	063	Climatronics	Other (10m Tower)
Wind Speed - Resultant	61103	Industrial	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (10m Tower)
Wind Speed - Scalar	61101	Industrial	1	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (10m Tower)
Wind Speed - Vertical	61109	Industrial	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (10m Tower)
WS - Sigma Theta (Vertical)	61110	Industrial	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (10m Tower)

Rush Island, Johnson Tall Tower — AQS Site Number 29-099-9008

600 Johnson Rd., Festus, MO 63028

Latitude: 38.11999 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.28214 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 656

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Outdoor Temperature	62101	Industrial	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (62.5m Probe Height)
Outdoor Temperature	62101	Industrial	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (132.5m Probe Height)
Outdoor Temperature Diff	62106	Industrial	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (132.5m-62.5m Probe Heights)
Std Dev Hz Wind Direction	61106	Industrial	1	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (132.5m, 15 min)
Std Dev Hz Wind Direction	61106	Industrial	2	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (132.5m, 60 min)
Std Dev Hz Wind Direction	61106	Industrial	3	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (62.5m, A-15 min)
Std Dev Hz Wind Direction	61106	Industrial	4	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (62.5m, A-60 min)
Std Dev Hz Wind Direction	61106	Industrial	5	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (62.5m, B-15 min)

Std Dev Hz Wind Direction	61106	Industrial	6	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (62.5m, B-60 min)
Std Dev Vt Wind Direction	61107	Industrial	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (132.5m, 15 min)
Std Dev Vt Wind Direction	61107	Industrial	2	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (132.5m, 60min)
Std Dev Vt Wind Direction	61107	Industrial	3	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (62.5m, A-15 min)
Std Dev Vt Wind Direction	61107	Industrial	4	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (62.5m, A-60min)
Std Dev Vt Wind Direction	61107	Industrial	5	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (62.5m, B-15 min)
Std Dev Vt Wind Direction	61107	Industrial	6	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (62.5m, B-60 min)
Wind Direction - Resultant	61104	Industrial	1	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (132.5m Probe Height)
Wind Direction - Resultant	61104	Industrial	2	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (62.5m Probe Height)
Wind Direction - Resultant	61104	Industrial	3	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (62.5m Probe Height)

Wind Direction - Scalar	61102	Industrial	1	☐	1	N/A	MET	014	deg	063	Climatronics	Other (132.5m Probe Height)
Wind Direction - Scalar	61102	Industrial	2	☐	1	N/A	MET	014	deg	063	Climatronics	Other (62.5m Probe Height)
Wind Direction - Scalar	61102	Industrial	3	☐	1	N/A	MET	014	deg	063	Climatronics	Other (62.5m Probe Height)
Wind Speed - Resultant	61103	Industrial	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (132.5m Probe Height)
Wind Speed - Resultant	61103	Industrial	2	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (62.5m Probe Height)
Wind Speed - Resultant	61103	Industrial	3	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (62.5m Probe Height)
Wind Speed - Scalar	61101	Industrial	1	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (132.5m Probe Height)
Wind Speed - Scalar	61101	Industrial	2	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (62.5m Probe Height)
Wind Speed - Scalar	61101	Industrial	3	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (62.5m Probe Height)
Wind Speed - Vertical	61109	Industrial	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (132.5m Probe Height)

Wind Speed - Vertical	61109	Industrial	2	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (62.5m Probe Height)
Wind Speed - Vertical	61109	Industrial	3	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (62.5m Probe Height)
WS - Sigma Theta (Vertical)	61110	Industrial	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (132.5m Probe Height)
WS - Sigma Theta (Vertical)	61110	Industrial	2	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (62.5m Probe Height)
WS - Sigma Theta (Vertical)	61110	Industrial	3	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (62.5m Probe Height)

Rush Island, Natchez — *AQS Site Number* 29-099-9009

917 Natchez Trace Drive, Bloomsdale, MO 63627

Latitude: 38.10525 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.29842 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 505

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented

Rush Island, Weaver Road & Highway AA

AQS Site Number 29-099-9007

802 Weaver Road, Festus, MO 63028

Latitude:	38.144972	***AQCR:***	070	Metropolitan St. Louis
Longitude:	-90.304783	***MSA:***	7040	St. Louis, MO-IL
Elevation (ft):	502			

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented

Doe Run Buick (PQAO - 1290)

County Road 75

AQS Site Number 29-093-9010

98 Iron County Road, Bixby, MO 65439

Latitude: 37.64876 ***AQCR:*** 138 SE Missouri

Longitude: -91.14980 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 1365

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Doe Run Buick - Buick NE

AQS Site Number 29-093-9008

346 Power Lane, Bixby West, MO 65439

Latitude: 37.65214 ***AQCR:*** 138 SE Missouri

Longitude: -91.11689 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 1423

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/1	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented

Doe Run Buick - North #5 (NON-A)

AQS Site Number 29-093-0021

Doe Run Buick - North#5, Buick, MO 65439

Latitude: 37.65178 ***AQCR:*** 138 SE Missouri

Longitude: -91.13094 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 1443

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	SIP	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented

Doe Run Buick - South #1 (NON-A)

AQS Site Number 29-093-0016

Doe Run Buick - South#1, Buick, MO 65439

Latitude: 37.62400 ***AQCR:*** 138 SE Missouri

Longitude: -91.12827 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 1502

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	SIP	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Lead (TSP) - LC FRM/FEM	14129	Industrial	2	☑	1/6	MID	SIP	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Quality Assurance (Collocation)

Hwy 32 Northeast

AQS Site Number 29-093-9009

1582 Highway 32, Bixby, MO 65439

Latitude: 37.65319 ***AQCR:*** 138 SE Missouri

Longitude: -91.12795 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 1384

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective

Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

West Entrance — *AQS Site Number* 29-093-9011

18594 Hwy KK, Boss, MO 65440

Latitude: 37.63211 ***AQCR:*** 138 SE Missouri

Longitude: -91.13565 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 1463

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Doe Run Herculaneum (PQAO - 1290)

Herculaneum, City Hall (Mott Street) — *AQS Site Number* 29-099-0020

360 Short Street, Herculaneum, MO, 63048

Latitude: 38.263394 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.379667 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 468

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/3	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Highest Concentration
Lead (TSP) - LC FRM/FEM	14129	Industrial	2	☑	1/6	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Quality Assurance (Collocation)

Herculaneum, Dunklin High School — *AQS Site Number* 29-099-9002

1 Black cat Dr., Herculaneum, MO, 63048

Latitude: 38.26703 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.37875 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 445

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented and Population Exposure

Herculaneum, North Cross — *AQS Site Number* 29-099-0023

North Cross, Herculaneum, MO 63048

Latitude:	38.26216	***AQCR:***	070	Metropolitan St. Louis
Longitude:	-90.38126	***MSA:***	7040	St. Louis, MO-IL
Elevation (ft):	463			

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Population Exposure

Environmental Services Program (ESP) [PQAO - 0588]

Alba — AQS Site Number 29-097-0004

20400 Millwood Rd., Alba, MO 64830

Latitude: 37.2385 ***AQCR:*** 139 SW Missouri

Longitude: -94.42468 ***MSA:*** 3710 Joplin, MO

Elevation (ft): 965

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Arnold West — AQS Site Number 29-099-0019

1709 Lonedell Dr., Arnold, MO 63010

Latitude: 38.44862 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.3958 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 639

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Ammonium Ion PM2.5 LC	88301	SLAMS	6	☐	1/6	NBR	RES	105	ug/m^3-LC	812	Met One SASS Nylon	Population Exposure (UC-Davis)

Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
OP CSN_Rev Undj PM2.5 LC TOR	88378	SLAMS	6	☐	1/6	NBR	RES	105	ug/m^3-LC	842	URG 3000N w/Pall Quartz filter & Cyclone Inlet	Population Exposure (UC-Davis)
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	NBR	COM	001	ug/m^3	079	R&P SA246B TEOM	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 Volatile Channel	88503	SPM	4	☐	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure

Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Blair Street — *AQS Site Number* 29-510-0085

3247 Blair Street, St. Louis, MO 63107

Latitude: 38.65638 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.19825 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 492

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
1,2,3-trimethylbenzene	45225	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
1,2,4-trimethylbenzene	45208	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
1-butene	43280	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
2,2,4-trimethylpentane	43250	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact

Acetaldehyde	43503	PAMS	1	☐	1	URB	PAMS	078	ppbC	202	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Ammonium Ion PM2.5 LC	88301	SPM	6	☐	1/3	NBR	RES	105	ug/m^3-LC	812	Met One SASS Nylon	
Barometric Pressure	64101	SLAMS	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Benzene	45201	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Black Carbon PM2.5 LC	88313	SLAMS	1	☐	1	NBR	RES	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Population Exposure
Carbon Monoxide	42101	NCORE	1	☐	1	NBR	COM	007	ppm	593	Teledyne T300U	Population Exposure
cis-2-butene	43217	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Ethane	43202	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Ethylbenzene	45203	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact

Ethylene	43203	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Formaldehyde	43502	PAMS	1	☐	1	URB	PAMS	078	ppbC	202	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Indoor Temperature	62107	SLAMS	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other (Large Shelter)
Indoor Temperature	62107	SLAMS	2	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other (Small Shelter)
Isobutane	43214	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Isopentane	43221	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Isoprene	43243	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Lead PM10 LC	85128	SPM	6	☐	1/6	NBR	RES	108	ng/m^3-LC	907	R&P Partisol 2025 Teflon	Population Exposure (ERG)
Lead PM10 LC	85128	SPM	7	☑	1/6	NBR	RES	108	ng/m^3-LC	907	R&P Partisol 2025 Teflon	Population Exposure (ERG)
M&P-xylenes	45109	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact

M-ethyltoluene	45212	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Mixing Layer Height	61301	PAMS	1	☐	1	NBR	MET	058	m	011	Ceilometer	Max precursor emissions impact
N-butane	43212	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
N-hexane	43231	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Nitric Oxide	42601	NCORE	1	☐	1	NBR	COM	008	ppb	699	Teledyne API 200 EU/501	Population Exposure
Nitric Oxide	42601	SLAMS	3	☐	1	NBR	COM	008	ppb	256	Teledyne API Model N500	Population Exposure
Nitrogen Dioxide	42602	SLAMS	3	☐	1	NBR	COM	008	ppb	256	Teledyne API Model N500	Population Exposure
N-pentane	43220	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
O-ethyltoluene	45211	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact

OP CSN_Rev Undj PM2.5 LC TOR	88378	SPM	6	☐	1/3	NBR	RES	105	ug/m^3-LC	842	URG 3000N w/Pall Quartz filter & Cyclone Inlet	Highest Concentration (UC-Davis)
Outdoor Temperature	62101	NCORE	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Oxides of Nitrogen (Nox)	42603	SLAMS	3	☐	1	NBR	COM	008	ppb	256	Teledyne API Model N500	Population Exposure
Ozone	44201	NCORE	1	☐	1	NBR	COM	007	ppm	087	Ultraviolet Absorption	Population Exposure
Ozone	44201	NCORE	2	☑	1	NBR	COM	007	ppm	087	Ultraviolet Absorption	-
PM10 - LC/FEM/NonFEM	85101	SLAMS	5	☐	1	NBR	COM	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM10 - LC/FEM/NonFEM	85101	SPM	6	☐	1	NBR	RES	105	ug/m^3-LC	639	Teledyne API T640x	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	6	☐	1	NBR	RES	001	ug/m^3	639	Teledyne API T640x	Population Exposure
PM2.5 - LC FRM/FEM	88101	NCORE	2	☐	1/3	NBR	COM	105	ug/m^3-LC	145	R&P 2025 Sequential w/VSCC	Quality Assurance (Collocation)
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure

PM2.5 - LC FRM/FEM	88101	SPM	6	☐	1	NBR	RES	105	ug/m^3-LC	638	Teledyne API T640x	Population Exposure
PM2.5 Tot Atmospheric	88500	SLAMS	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SLAMS	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PMCoarse - LC FRM/FEM	86101	NCORE	6	☐	1	NBR	RES	105	ug/m^3-LC	640	Teledyne API T640x	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure
Precipitation	65102	PAMS	1	☐	1	NBR	MET	021	inches	014	Heated Tipping Bucket	Max precursor emissions impact
Propane	45204	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Propylene	43205	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Reactive Oxides of N (Noy)	42600	NCORE	1	☐	1	NBR	COM	008	ppb	699	Teledyne API 200 EU/501	Population Exposure

Relative Humidity	62201	NCORE	1	☐	1	N/A	MET	019	%humidity	014	Instrumental-Hygromer C94 Probe	Other
Solar Radiation	63301	SLAMS	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
Styrene	45220	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Sulfur Dioxide	42401	NCORE	1	☐	1	NBR	COM	008	ppb	560	Pulsed Fluorescent 43i-TLE	Population Exposure
Sulfur Dioxide Max 5-min Avg	42406	NCORE	1	☐	1	NBR	COM	008	ppb	560	Pulsed Fluorescent	Population Exposure
Toluene	45202	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Trans-2-butene	43216	PAMS	1	☐	1	URB	PAMS	078	ppbC	128	CAS Auto-Gas Chromatograph	Max precursor emissions impact
Ultraviolet Radiation	63302	PAMS	1	☐	1	NBR	MET	079	W/m^2	011	UV Radiometer (Photometer)	Max precursor emissions impact

UV Carbon PM2.5 LC	88314	SLAMS	1	☐	1	NBR	RES	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Population Exposure
Wind Direction - Resultant	61104	NCORE	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	NCORE	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Blue Ridge, I-70 (Site discontinued, to be relocated) *AQS Site Number* 29-095-0042

4018 Harvard Lane, Kansas City, MO 64133

Latitude: 39.047911 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.450513 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 960

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Black Carbon PM2.5 LC	88313	SPM	1	☐	1	MIC	COM	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
Carbon Monoxide	42101	SLAMS	1	☐	1	MIC	COM	007	ppm	554	Gas Filter Corr Thermo Electron 48i TLE	Source Oriented
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other

Nitric Oxide	42601	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Nitrogen Dioxide	42602	SLAMS	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other
Oxides of Nitrogen (Nox)	42603	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	MIC	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Source Oriented
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PM2.5 Volatile Channel	88503	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented

Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
UV Carbon PM2.5 LC	88314	SPM	1	☐	1	MIC	COM	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Bonne Terre — *AQS Site Number* 29-186-0005

15797 Highway D, Bonne Terre, MO 63628

Latitude: 37.90084 ***AQCR:*** 138 SE Missouri

Longitude: -90.42388 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 840

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	REG	COM	007	ppm	047	Ultraviolet Photometric	Regional Transport
Ozone	44201	SLAMS	2	☑	1	REG	COM	007	ppm	047	Ultraviolet Photometric	-
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other

Branch Street — *AQS Site Number* 29-510-0093

100 Branch St., St. Louis, MO 63102

Latitude: 38.65643 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.18977 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 429

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)

PM10 - LC/FEM/NonFEM	85101	SPM	6	☐	1	NBR	RES	105	ug/m^3-LC	639	Teledyne API T640x	Source Oriented
PM10 - STP FRM/FEM	81102	SLAMS	6	☐	1	NBR	RES	105	ug/m^3-LC	639	Teledyne API T640x	Source Oriented
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	MID	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Source Oriented
PM2.5 - LC FRM/FEM	88101	SPM	6	☐	1	NBR	RES	105	ug/m^3-LC	638	Teledyne API T640x	Source Oriented
PM2.5 Volatile Channel	88503	SPM	4	☐	1	MID	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Source Oriented
PMCoarse - LC FRM/FEM	86101	SPM	6	☐	1	NBR	RES	105	ug/m^3-LC	640	Teledyne API T640x	Source Oriented
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Std Dev Hz Wind Direction	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Buick NE — *AQS Site Number* 29-093-0034

346 Power Lane, Bixby West, MO 65439

Latitude: 37.65212 ***AQCR:*** 138 SE Missouri

Longitude: -91.11653 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 1423

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	MID	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented & Highest Concentration
Lead (TSP) - LC FRM/FEM	14129	SLAMS	2	☑	1/6	MID	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Quality Assurance (Collocation)
Sulfur Dioxide	42401	SPM	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10 meters)

Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10 meters)

Carthage — AQS Site Number 29-097-0003

530 Juniper, Carthage, MO 64836

Latitude: 37.19822 ***AQCR:*** 139 SW Missouri

Longitude: -94.31702 ***MSA:*** 3710 Joplin, MO

Elevation (ft): 986

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	MID	COM	001	ug/m^3	079	R&P SA246B TEOM	Source Oriented
PM10 - STP FRM/FEM	81102	SLAMS	4	☑	1	MID	COM	001	ug/m^3	079	R&P SA246B TEOM	Quality Assurance (Collocation)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (5.5 meters)

Dunklin High School — AQS Site Number 29-099-0005

1 Black Cat Dr., Herculaneum, MO, 63048

Latitude: 38.26703 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.37875 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 445

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented

El Dorado Springs — AQS Site Number 29-039-0001

Highway 97 & Barnes Road, El Dorado Springs, MO 64744

Latitude: 37.70097 **AQCR:** 139 SW Missouri

Longitude: -94.03474 **MSA:** 0000 Not in an MSA

Elevation (ft): 965

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Ozone	44201	SLAMS	1	☐	1	REG	COM	007	ppm	047	Ultraviolet Photometric	Regional Transport

Ozone	44201	SLAMS	2	☑	1	REG	COM	007	ppm	047	Ultraviolet Photometric	-
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	REG	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Regional Transport
PM2.5 Volatile Channel	88503	SPM	4	☐	1	REG	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Regional Transport
Relative Humidity	62201	SPM	2	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (5.5 meters)

Farrar — *AQS Site Number* 29-157-0001

County Rd. 342, Farrar, MO 63746

Latitude: 37.70264 ***AQCR:*** 138 SE Missouri

Longitude: -89.698640 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 497

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other

Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Fellows Lake — *AQS Site Number* 29-077-0042

4208 E. Farm Rd. 66, Springfield, MO 65803

Latitude: 37.319254 ***AQCR:*** 139 SW Missouri

Longitude: -93.214758 ***MSA:*** 7920 Springfield, MO

Elevation (ft): 1346

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	URB	COM	007	ppm	047	Ultraviolet Photometric	-

Finger Lakes — *AQS Site Number* 29-019-0011

1505 E. Peabody Road, Columbia, MO 65202

Latitude: 39.07803 ***AQCR:*** 137 Northern Missouri

Longitude: -92.31632 ***MSA:*** 1740 Columbia, MO

Elevation (ft): 726

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Foley West — *AQS Site Number* 29-113-0004

2100 Highway Y Foley, MO 63347

Latitude: 39.04577 ***AQCR:*** 137 Northern Missouri

Longitude: -90.84927 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 715

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Forest City, Exide Levee

AQS Site Number 29-087-0008

25942 Hwy 111, Forest City, MO 64451

Latitude: 40.027222 ***AQCR:*** 137 Northern Missouri

Longitude: -95.235833 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 904

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	MID	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented

Forest Park

AQS Site Number 29-510-0094

5600 Clayton Avenue, St. Louis, MO 63110

Latitude: 38.63114 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.28115 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 551

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Black Carbon PM2.5 LC	88313	SPM	1	☐	1	MIC	COM	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
Carbon Monoxide	42101	SLAMS	1	☐	1	MIC	COM	007	ppm	554	Gas Filter Corr Thermo Electron 48i TLE	Source Oriented
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other

Nitric Oxide	42601	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Nitrogen Dioxide	42602	SLAMS	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (10m - 2m Probe Height)
Oxides of Nitrogen (Nox)	42603	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	MIC	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Source Oriented
PM2.5 - LC FRM/FEM	88101	SPM	6	☐	1	N/A	COM	105	ug/m^3-LC	636	Teledyne API T640	Source Oriented
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented

PM2.5 Volatile Channel	88503	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Solar Radiation	63301	SLAMS	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
UV Carbon PM2.5 LC	88314	SPM	1	☐	1	MIC	COM	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Front Street — AQS Site Number 29-095-0018

1331 N. Jackson, Kansas City, MO 64120

Latitude:	39.13198	**AQCR:**	094	Metropolitan Kansas City
Longitude:	-94.52137	**MSA:**	3760	Kansas City, MO-KS
Elevation (ft):	728			

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	NBR	COM	001	ug/m^3	079	R&P SA246B TEOM	Highest Concentration & Population Exposure

Herculaneum, Mott Street — AQS Site Number 29-099-0027

747 Mott St., Herculaneum, MO, 63048

Latitude:	38.263394	**AQCR:**	070	Metropolitan St. Louis
Longitude:	-90.379667	**MSA:**	7040	St. Louis, MO-IL
Elevation (ft):	468			

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/3	MID	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented & Highest Concentration
Lead (TSP) - LC FRM/FEM	14129	SLAMS	2	☑	1/6	MID	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Quality Assurance (Collocation)

Sulfur Dioxide	42401	SLAMS	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented & Highest Concentration
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented & Highest Concentration
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (5.5 meters)

Herculaneum, Sherman — *AQS Site Number* **29-099-0013**

460 Sherman St., Herculaneum, MO, 63048

Latitude: 38.27170 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.37658 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 462

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented

Hillcrest High School — *AQS Site Number* **29-077-0036**

3319 N. Grant, Springfield, MO 65803

Latitude: 37.25607 ***AQCR:*** 139 SW Missouri

Longitude: -93.29970 ***MSA:*** 7920 Springfield, MO

Elevation (ft): 1321

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	URB	COM	007	ppm	047	Ultraviolet Photometric	-
PM10 - LC/FEM/NonFEM	85101	SLAMS	6	☐	1	NBR	RES	105	ug/m^3-LC	639	Teledyne API T640x	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	6	☐	1	NBR	RES	105	ug/m^3-LC	639	Teledyne API T640x	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 - LC FRM/FEM	88101	SPM	6	☐	1	NBR	RES	105	ug/m^3-LC	638	Teledyne API T640x	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure

Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other

Ladue (To Discontinue FRM) — *AQS Site Number* **29-189-3001**

73 Hunter Ave., Ladue, MO 63124

Latitude: 38.65028 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.35021 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 511

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
PM2.5 - LC FRM/FEM	88101	SLAMS	2	☑	1/6	NBR	COM	105	ug/m^3-LC	145	R&P 2025 Sequential w/VSCC	Quality Assurance (Collocation)
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 Volatile Channel	88503	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure

Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other

Liberty — *AQS Site Number* 29-047-0005

Highway 33 & County Home Rd., Liberty, MO 64068

Latitude: 39.30314 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.37678 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 941

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure

PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other

Mark Twain State Park — *AQS Site Number* 29-137-0001

20057 State Park Office Rd., Stoutsville, MO 65283

Latitude: 39.474906 ***AQCR:*** 137 Northern Missouri

Longitude: -91.78878 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 710

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Nitric Oxide	42601	SPM	1	☐	1	REG	COM	008	ppb	074	Chemiluminescence	General/Background
Nitrogen Dioxide	42602	SPM	1	☐	1	REG	COM	008	ppb	074	Chemiluminescence	General/Background
Oxides of Nitrogen (Nox)	42603	SPM	1	☐	1	REG	COM	008	ppb	074	Chemiluminescence	General/Background

Ozone	44201	SLAMS	1	☐	1	REG	COM	007	ppm	047	Ultraviolet Photometric	General/Background
Ozone	44201	SLAMS	2	☑	1	REG	COM	007	ppm	047	Ultraviolet Photometric	-
PM10 - STP FRM/FEM	81102	SPM	3	☐	1	REG	SIP	001	ug/m^3	079	R&P SA246B TEOM	General/Background
Sulfur Dioxide	42401	SPM	1	☐	1	REG	SIP	008	ppb	060	Pulsed Fluorescent	General/Background
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	NBR	COM	008	ppb	060	Pulsed Fluorescent	General/Background
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Maryland Heights — *AQS Site Number* **29-189-0014**

13044 Marine Ave., Maryland Heights, MO 63146

Latitude: 38.71085 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.47606 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 607

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

New Bloomfield — *AQS Site Number* 29-027-0002

2625 Meadow Lake View, New Bloomfield, MO, 65063

Latitude: 38.70608 ***AQCR:*** 137 Northern Missouri

Longitude: -92.09308 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 860

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Oates

AQS Site Number 29-179-0034

13155 Highway KK, Boss, MO 65440

Latitude:	37.56485	***AQCR:***	138	SE Missouri
Longitude:	-91.11423	***MSA:***	0000	Not in an MSA
Elevation (ft):	1134			

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented

Orchard Farm

AQS Site Number 29-183-1004

2165 Highway V, St. Charles, MO 63301

Latitude:	38.8994	***AQCR:***	070	Metropolitan St. Louis
Longitude:	-90.44917	***MSA:***	7040	St. Louis, MO-IL
Elevation (ft):	441			

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	URB	COM	007	ppm	047	Ultraviolet Photometric	-

Pacific

AQS Site Number 29-189-0005

18701 Old Highway 66, Pacific, MO 63069

Latitude: 38.49011 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.70509 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 524

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Richards Gebaur-South

AQS Site Number 29-037-0003

1802 E. 203rd Street, Belton, MO, 64012

Latitude: 38.75961 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.57983 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 1082

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other

Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	087	Ultraviolet Absorption	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	087	Ultraviolet Absorption	-
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Rider Trail, I-70 — AQS Site Number 29-189-0016

13080 Hollenberg Drive, Bridgeton, MO 63044

Latitude: 38.75264 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.44884 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 515

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Nitric Oxide	42601	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Nitrogen Dioxide	42602	SLAMS	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (10m - 2m Probe Height)

Oxides of Nitrogen (Nox)	42603	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
Sulfur Dioxide	42401	SPM	1	☐	1	MID	SPP	008	ppb	100	Ultra-violet Fluorescence	Population Exposure
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	MID	SPP	008	ppb	100	Ultra-violet Fluorescence	Population Exposure
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Rocky Creek — AQS Site Number 29-047-0006

2-114 NW 132 St., Kansas City, MO 64165

Latitude: 39.33181 **AQCR:** 094 Metropolitan Kansas City

Longitude: -94.58069 **MSA:** 3760 Kansas City, MO-KS

Elevation (ft): 990

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Savannah — AQS Site Number 29-003-0001

11796 Highway 71, Savannah, MO 64485

Latitude: 39.9544 **AQCR:** 137 Northern Missouri

Longitude: -94.849 **MSA:** 7000 St. Joseph, MO

Elevation (ft): 1120

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure

Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

South Broadway — AQS Site Number 29-510-0007

8227 South Broadway, St. Louis, MO 63111

Latitude: 38.5425 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.263611 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 452

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SLAMS	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 Volatile Channel	88503	SPM	4	☐	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other

St. Joseph Pump Station — AQS Site Number 29-021-0005

S. Highway 759, St. Joseph, MO 64501

Latitude: 39.741667 **AQCR:** 094 Metropolitan Kansas City

Longitude: -94.858333 **MSA:** 7000 St. Joseph, MO

Elevation (ft): 845

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Barometric Pressure	64101	SPM	2	☑	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Outdoor Temperature	62101	SPM	2	☑	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	NBR	COM	001	ug/m^3	079	R&P SA246B TEOM	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure

PM2.5 - LC FRM/FEM	88101	SLAMS	5	☑	1	NBR	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Quality Assurance (Collocation)
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 Volatile Channel	88503	SPM	2	☑	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Quality Assurance (Collocation)
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Relative Humidity	62201	SPM	2	☑	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (5.5 meters)

Trimble — *AQS Site Number* 29-049-0001

7536 SW. O Highway, Trimble, MO 64492

Latitude: 39.53063 ***AQCR:*** 137 Northern Missouri

Longitude: -94.55594 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 1033

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Troost — *AQS Site Number* 29-095-0034

724 Troost (Rear), Kansas City, MO 64106

Latitude: 39.10463 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.57040 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 941

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Nitric Oxide	42601	SPM	1	☐	1	URB	COM	008	ppb	074	Chemiluminescence	Population Exposure
Nitrogen Dioxide	42602	SLAMS	1	☐	1	URB	COM	008	ppb	074	Chemiluminescence	Population Exposure

Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Oxides of Nitrogen (Nox)	42603	SPM	1	☐	1	URB	COM	008	ppb	074	Chemiluminescence	Population Exposure
PM10 - LC/FEM/NonFEM	85101	SPM	6	☐	1	NBR	RES	105	ug/m^3-LC	639	Teledyne API T640x	Population Exposure
PM10 - STP FRM/FEM	81102	SPM	6	☐	1	NBR	RES	001	ug/m^3	639	Teledyne API T640x	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	581	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 - LC FRM/FEM	88101	SPM	6	☐	1	NBR	RES	105	ug/m^3-LC	638	Teledyne API T640x	Population Exposure
PM2.5 Volatile Channel	88503	SPM	4	☐	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Sulfur Dioxide	42401	SLAMS	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Sulfur Dioxide Max 5-min Avg	42406	SLAMS	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Watkins Mill State Park — *AQS Site Number* 29-047-0003

Watkins Mill Road, Lawson, MO 64062

Latitude: 39.40770 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.26539 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 1009

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	URB	COM	007	ppm	047	Ultraviolet Photometric	-

West Alton — *AQS Site Number* 29-183-1002

General Electric Store, Highway 94, West Alton, MO 63386

Latitude: 38.8725 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.226389 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 425

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other

Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	URB	COM	007	ppm	047	Ultraviolet Photometric	-
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Magnitude 7 Metals (PQAO - 2368)

Magnitude 7 Metals, Site # 1 AECI Water Tower Location — *AQS Site Number* 29-143-9001

391 St Jude Industrial Park, New Madrid, MO 63869

Latitude: 36.51364 ***AQCR:*** 138 SE Missouri

Longitude: -89.56093 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 297

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	Industrial	1	☐	1	MID	MET	017	deg C	013	Electronic Averaging	Other
Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Magnitude 7 Metals, Site # 2 East Graveyard — *AQS Site Number* 29-143-9002

391 St Jude Industrial Park, New Madrid, MO 63869

Latitude: 36.50838 ***AQCR:*** 138 SE Missouri

Longitude: -89.56074 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 296

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	Industrial	1	☐	1	MID	MET	017	deg C	013	Electronic Averaging	Other

Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Magnitude 7 Metals, Site # 3 West Entrance *AQS Site Number* **29-143-9003**

391 St Jude Industrial Park, New Madrid, MO 63869

Latitude: 36.50899 ***AQCR:*** 138 SE Missouri

Longitude: -89.57099 ***MSA:*** 0000 Not in an MSA

Elevation (ft): 298

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	Industrial	1	☐	1	MID	MET	017	deg C	013	Electronic Averaging	Other
Sulfur Dioxide	42401	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Wind Direction - Resultant	61104	Industrial	1	☐	1	MID	MET	014	deg	065	Instrumental: RM Young Model 05305	Other
Wind Speed - Resultant	61103	Industrial	1	☐	1	MID	MET	011	m/s	065	Instrumental: RM Young Model 05305	Other

Comment From Advantage Metals Recycling:

June 28, 2024

Missouri Department of Natural Resources
Air Pollution Control Program
Air Quality Analysis Section/Air Monitoring Unit
PO Box 176
Jefferson City MO 65102

To whom it may concern,

Thank you for the opportunity to provide written comments on the 2024 Monitoring Network Plan. After carefully reviewing the draft network plan, Advantage Metal Recycling (AMR) provides the comments relating to the ambient monitoring station located at the Branch Street site in the St. Louis CBSA. As noted in the draft network plan on page 31, the Branch St. site does not meet the quality assurance criteria of 40 CFR 58, Appendix E:

> *The department performed a site evaluation at the Branch St. site in the St. Louis CBSA in April 2023. The evaluation identified two items which may not meet the requirements in federal regulation in 40 C.F.R. § 58 Appendix E. A potential obstruction as described in 40 C.F.R. § 58 Appendix E.4.(b) and a nearby unpaved area as defined in 40 C.F.R. § 58 Appendix E.3.(a) were identified as items of concern during the evaluation.*

Considering the monitor location and the inability to meet the requirements of "Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring" obligations under 40 CFR 58, Appendix E, the Missouri Department of Natural Resources (MDNR) should discontinue ambient air monitoring to measure particulate matter less than 10 microns (PM_{10}) at the site. Further, previously collected ambient air monitoring data fails to meet the quality assurance requirements and should not be certified for use in determining compliance with the National Ambient Air Quality Standards for PM_{10}.

If MDNR does not propose to discontinue PM_{10} ambient air monitoring, then AMR recommends designating the monitor as a "Special Purpose Monitor" and not use the collected ambient air monitoring data for compliance evaluations for PM_{10}.

Additionally, publicly available air monitoring data from MDNR's website illustrates industrial activity surrounding the Branch Street air monitoring station does not appear to affect nearby residential properties as depicted from Blair Street air monitoring station data.

Thank you for consideration of these comments. If you have questions, comments, or would like additional information, please contact me at your convenience.

Sincerely,

megan funk

Megan Funk
Environmental Engineer

Comment Response to Advantage Metals Recycling

The 2024 Monitoring Network Plan did not include the following language:

> *The department performed a site evaluation at the Branch St. site in the St. Louis CBSA in April 2023. The evaluation identified two items which may not meet the requirements in federal regulation in 40 C.F.R. § 58 Appendix E. A potential obstruction as described in 40 C.F.R. § 58 Appendix E.4.(b) and a nearby unpaved area as defined in 40 C.F.R. § 58 Appendix E.3.(a) were identified as items of concern during the evaluation.*

This language was included in the 2023 Monitoring Network Plan. The Missouri Department of Natural Resources' Air Pollution Control Program received a very similar comment letter from Advanced Metals Recycling during the 2023 Monitoring Network Plan public notice period. The department responded to this comment as a part of finalizing the 2023 Monitoring Network Plan. The department's response to that comment was:

> *The Missouri Department of Natural Resources' Air Pollution Control Program performed a site evaluation at the Branch St. site in the St. Louis Core Based Statistical Area in April 2023. The evaluation identified two items which may not meet the requirements in federal regulation in 40 C.F.R. § 58 Appendix E. A potential obstruction as described in 40 C.F.R. § 58 Appendix E.4.(b) and a nearby unpaved area as defined in 40 C.F.R. § 58 Appendix E.3.(a) were identified as items of concern during the evaluation. The department and United States Environmental Protection Agency Staff (EPA Region 7) jointly visited the site on May 31, 2023 in order to follow up on the evaluation performed on April 26, 2023. After consultation with EPA Region 7 and further review of the applicable regulations, the department has found that the site is meeting the regulatory requirements of 40 CFR Part 58 Appendix E.4(a) and 40 CFR Part 58 Appendix E.3(a).*
>
> *Department staff believe that continuation of monitoring at the Branch St. site is necessary to determine the air quality impact of facilities near the site. The department continues to work with facilities in the area near the site to reduce PM10 emissions. The department did not make any changes to the plan related to this comment other than adding two sentences on page 31 in Section 6 regarding further evaluation of the Branch St. site, as discussed above.*

Advanced Metals Recycling's comment to the draft 2024 Monitoring Network Plan did expand upon the comment to the 2023 Monitoring Network Plan with:

> *Additionally, publicly available air monitoring data from MDNR's website illustrates industrial activity surrounding the Branch Street air monitoring station does not appear to affect nearby residential properties as depicted from Blair Street air monitoring station data.*

The primary National Ambient Air Quality Standards (NAAQS) for particulate matter are health based standards that must be met in areas considered ambient air. 40 CFR Part 50.1(e) defines Ambient Air as: *Ambient air means that portion of the atmosphere, external to buildings, to which the general public has access.* The particulate matter monitoring at the Branch St.

monitoring location is considered ambient air monitoring and is therefore subject to the NAAQS. The department did not make any changes to the plan related to this comment.

Comment from Great Rivers Environmental Law Center:

June 30, 2024

VIA ELECTRONIC MAIL

Missouri Department of Natural Resources
Air Pollution Control Program
Air Quality Analysis Section/Air Monitoring Unit
P.O. Box 176
Jefferson City, MO 65102-0176
cleanair@dnr.mo.gov

Re: Comments to Draft 2024 Monitoring Network Plan

To Whom It May Concern:

Great Rivers Environmental Law Center ("Great Rivers") respectfully submits to the Missouri Department of Natural Resources ("MDNR" or "DNR") the following comments to the proposed Draft 2024 Monitoring Network Plan (the "Plan").

Great Rivers is a public interest law firm that provides free legal services to individuals, organizations and citizen groups working to protect the environment and public health.

The Plan fails to address the impacts of air pollution on low-income people of color; fails to address several important state-wide sources of air pollution such as pollution from coal plants, CAFOs and mining operations; and on the whole fails to put forth a monitoring plan that includes sufficient ambient air monitoring, especially as it pertains to ozone monitoring. MDNR should address these failings in the Plan before issuing it in final form so as to protect the health of all Missourians, but in particular, the low-income people of color who have been systematically overburdened by air pollution in the state and as a result, are most vulnerable to its continued impacts. Doing so would be of direct benefit to Great Rivers and its clients and partners.

The Plan Fails to Comply with Title VI

MDNR appears to be in violation of Title VI of the Civil Rights Act of 1964, 42 U.S.C. § 2000d, and 40 C.F.R. Part 7 by releasing the Plan 1) without complying with any of the EPA procedural safeguard regulations found in 40 C.F.R. Part 7 to prevent discrimination; and 2) by failing to analyze whether the Plan causes disproportionate and disparate environmental and

human health effects on low-income communities of color in the State. MDNR must rectify these violations to avoid any unlawful discrimination by 1) implementing a Title VI program that complies with EPA regulations before issuing the Plan in final form and 2) including in the Plan an analysis of whether the Plan causes disproportionate or disparate environmental or human health impacts on low-income communities of color in the State.

Recipients of federal funding are prohibited from taking actions that have a discriminatory impact on people of color. Title VI of the Civil Rights Act of 1964 states:

> No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination under any program or activity receiving any Federal financial assistance. [1]

EPA's implementing regulations further prohibit recipients of EPA funding from discriminating. Specifically, EPA's Title VI regulations provide that an EPA funding recipient:

> shall not use criteria or methods of administering its program or activity which have the effect of subjecting individuals to discrimination because of their race, color, national origin, or sex, or have the effect of defeating or substantially impairing accomplishment of the objectives of the program or activity with respect to individuals of a particular race, color, national origin, or sex.[2]

EPA's regulations make clear that discrimination on the basis of race is a violation of Title VI whether such discrimination is the purpose of the decision or its effect.[3]

As a condition of receiving federal funding, recipient agencies such as MDNR must comply with EPA's Title VI regulations, which are incorporated by reference into the grants. These regulations proscribe discrimination on the basis of race, color or national origin by any program or agency receiving financial assistance from the EPA.[4] In other words, Title VI creates for recipients a nondiscrimination obligation that is contractual in nature, in exchange for Federal funding. Acceptance of EPA funding creates an obligation on the recipient to comply with the regulations for as long as that funding is provided.[5] In particular, a state agency accepting EPA funding may not take any action that is intentionally discriminatory or that will have a discriminatory effect based on race, color, or national origin.[6] MDNR, a state agency, is a recipient of federal funds governed by these requirements.

It does not appear that MDNR has conducted any of the safeguard procedures or analyses required by Title VI and EPA's implementing regulations in preparing the Plan. Before issuing

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[1] 42 U.S.C. § 2000d.
[2] 40 C.F.R. §§ 7.35(b).
[3] *Id.*
[4] 40 C.F.R. §§ 7.30; 7.35.
[5] 40 C.F.R. § 7.35.
[6] *Id.*

the Plan in final form, MDNR should satisfy the safeguarding requirements set forth in 40 CFR Part 7. These include, but are not limited to facilitating informational meetings for low-income communities of color about the Plan and the impacts it might have on those communities. Further, MDNR should include a consideration and analysis of the disparate and cumulative impacts that the Plan may have on low-income communities and/or communities of color. The undersigned respectfully request that MDNR take into consideration any such cumulative impacts that air pollution in Missouri has on low-income communities and communities of color in designing and maintaining its air monitoring network.

The Plan Contains Insufficient Ozone Monitoring

The undersigned believe the Plan proposes a wholly inadequate amount of ozone air monitoring, and encourages DNR to incorporate additional monitors throughout the network. Although the Plan may satisfy the population-based requirements of 40 C.F.R. § 58 Appendix D, DNR's proposal to squeak with the bare minimum number of monitors simply makes no sense in light of continued ozone exceedances around the state and the St. Louis metropolitan area's bump to moderate nonattainment. Notably, while population-based requirements mandate a minimum of 14 ozone monitoring sites in the neighboring state of Illinois, in 2023 the state operated more than twice that – 33 ozone monitors.[7] . DNR should similarly move Missouri beyond the minimum requirements, and towards a more informed monitoring network.

If DNR incorporated additional and more effective ozone monitoring, the benefits would be felt most significantly by those populations in the state that are most in need of support, having experienced the greatest cumulative burdens of ozone pollution. It is well-documented that air pollution, including ozone and its precursors, more severely impacts low-income people of color, many of whom are already overburdened by other sources of pollution.[8] This is the case because people of color, as well as those with lower incomes, are more likely to live near truck and traffic routes, as well as stationary sources of pollution.[9] As recorded by EPA's Environmental Justice Screening and Mapping Tool (EJScreen) displayed in the graphic below, the St. Louis metropolitan area is no exception, ranking in the country's highest percentile for ozone levels, likely because many areas bordering major highways and traffic thoroughfares and industrial polluters in the St. Louis area are populated by people of color and other economically disadvantaged communities.[10]

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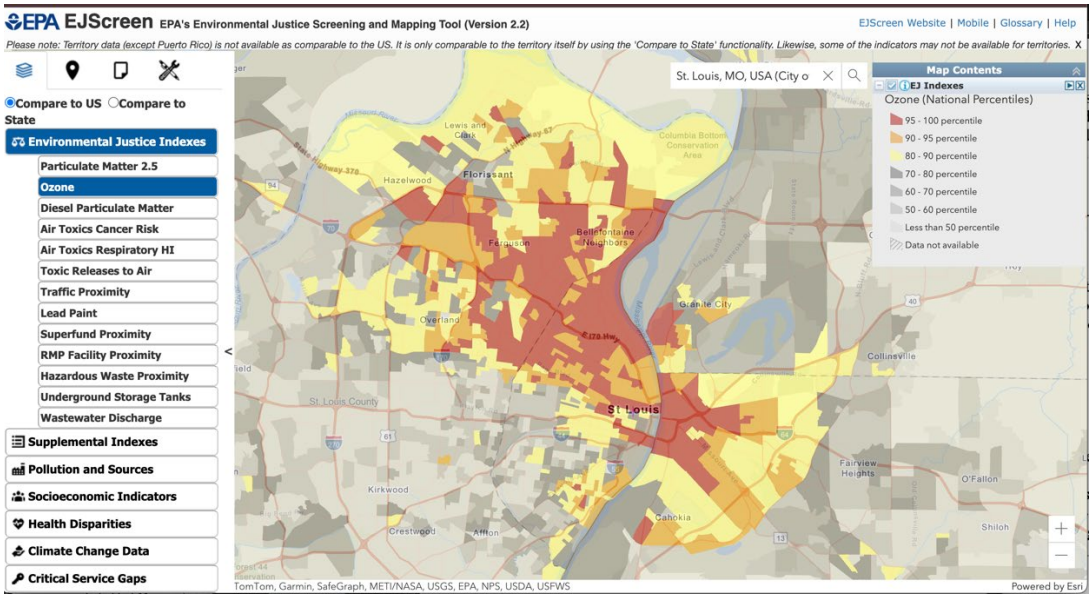
[7] Illinois Environmental Protection Agency, Bureau of Air, "State of Illinois Ambient Air Monitoring 2025 Network Plan," (May 2024).
[8] U.S. EPA, *Control of Air Pollution From New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards Proposed Rule,* 87 Fed. Reg. 17414, 17418, 17452 and 17584 (March 28, 2022).
[9] *Id.*
[10] *St. Louis, MO, USA*, EPA EJ SCREEN, https://ejscreen.epa.gov/mapper/ (last visited June 26, 2024). *See also,* Interdisciplinary Environmental Clinic at Washington University School of Law, *Environmental Racism in St. Louis,* located at https://7gxsl10eqdj9anba1k3swtoo-wpengine.netdna-ssl.com/wp-content/uploads/2020/08/2019-09-30_STL_Env_Racism_Report_REVISED_FINAL_Cropped.pdf; US EPA, *EJScreen,* Map Comparisons for St. Louis, Missouri, Pct. People of Color and Traffic Proximity, located at https://ejscreen.epa.gov/mapper/comparemapper.html; US EPA, *ECHO Enforcement and Compliance History*



[11]

It is well established that heightened exposure to NOx and ozone can contribute to a variety of adverse health impacts – in particular asthma and respiratory illness, as well as cardiovascular problems.[12] Perhaps reflective of this reality is the data obtained by the Missouri Department of Health and Senior Services that shows that Black residents were admitted to the emergency room for asthma at rates more than six times that of white residents in St. Louis County, and more than seven times that of white residents in St. Louis City.[13] Worse yet, the data demonstrates that over the course of an 11-year period, asthma-related emergency room admission rates dropped for white residents of Missouri and St. Louis City, but continue to climb for Black residents.[14]

All of the above-described data makes it clear that ozone pollution is a serious public health problem in the St. Louis area in particular, and throughout the State generally. Additional ozone and NOx monitors would go a long way towards understanding where the excess pollution is coming from, and in turn, would help DNR to devise mechanisms for addressing it. Data from additional monitors would also help inform residents' immediate health decisions, such as whether to let a child with asthma play outside on a high-ozone day.

Online, mapping tools for stationary air sources in the St. Louis area, located at https://echo.epa.gov/facilities/facility-search/results.

[11] *Id.*

[12] *See Note 10* at pp.17444-17447.

[13] MO. DEP'T OF HEALTH AND SENIOR SERV., ASTHMA IN MISSOURI 2021, https://health.mo.gov/living/healthcondiseases/chronic/asthma/pdf/MO-2021.pdf (2021).

[14] MO. DEP'T OF HEALTH AND SENIOR SERV, *DHSS-MOPHIMS Community Data Profiles,* located at https://healthapps.dhss.mo.gov/MoPhims/ProfileTrendAnalysis?pid=25&iid=25000153&ge=CNTY&gf=189&de=RACE.

Finally, anticipating the upcoming release of the Enhanced Monitoring Plan (EMP) for addressing ozone pollution in the St. Louis moderate nonattainment area, the undersigned would like to proactively request that DNR consider the following items for inclusion in the EMP:

- Consider guiding elements—additional ozone sites; additional nitrogen dioxide, nitrogen oxide, and/or nitric oxide sites; additional volatile organic compound measurements; and enhanced upper air measurements.

- Work with local agencies and community groups in the St. Louis metropolitan area to identify and select the most appropriate and effective monitoring locations.

- Include EPA Regional staff throughout the planning process and request assistance in syncing the air monitoring model with neighboring states' networks.

- Partner with other focus groups and/or St. Louis colleges or universities that may have valuable insight regarding monitoring locations, community development, and EMP implementation.

- Consider factors unique to the St. Louis metropolitan area, like terrain, multi-state transportation, city infrastructure, etc. when developing the scope and specifics of the EMP.

- Consult with affected political subdivisions (cities, counties, municipalities)—Franklin County; Boles Township; St. Charles County; St. Louis County; and the City of St. Louis—and consider a variety of approaches to developing the EMP in each area. Work with leaders in each subdivision to preserve avenues of communication and ensure routes of access for members of each community (i.e. arranging for the EMP to be linked on each city / county website).

- Given St. Louis' proximity to Illinois, it would be highly advantageous for DNR to work with IEPA to help capture a greater understanding of the local issues and coordinate air quality plans for the greater St. Louis area. In particular, IEPA's EMP plan for Chicago included "the continuation of additional ozone monitoring and nitrogen oxide monitoring in the Chicago CBSA, which are well above federally required minimum amounts."[15] Accordingly, the state conducted and published CBSA Toxics Monitoring for the Greater Chicago Area.[16]

[18] U.S. Energy Information Administration, *Missouri State Profile and Energy Estimates,* https://www.eia.gov/state/?sid=MO (last visited June 13, 2024).
[18] U.S. Energy Information Administration, *Missouri State Profile and Energy Estimates,* https://www.eia.gov/state/?sid=MO (last visited June 13, 2024).

Table 7: Chicago CBSA Toxics Monitoring

Monitor Count	State	County	Site	AQS ID	Pollutant Class
1	Illinois	Cook	Northbrook	17-031-4201	Carbonyls
2	Illinois	Cook	Northbrook	17-031-4201	Enhanced Carbonyls **(new in 2019)**
3	Illinois	Cook	Northbrook	17-031-4201	Volatile Organic Compounds
4	Illinois	Cook	Northbrook	17-031-4201	Semi-Volatile Organic Compounds
5	Illinois	Cook	Northbrook	17-031-4201	Enhanced Speciated Volatile Organic Compounds **(new in 2019)**
6	Illinois	Cook	Northbrook	17-031-4201	PM10 metals
7	Illinois	Cook	Schiller Park	17-031-3103	Carbonyls
8	Illinois	Cook	Schiller Park	17-031-3103	Volatile Organic Compounds
9	Indiana	Lake	Gary	18-089-0022	Volatile Organic Compounds
10	Indiana	Lake	Hammond	18-089-2008	Volatile Organic Compounds
11	Indiana	Porter	Ogden Dunes	18-127-0024	Volatile Organic Compounds

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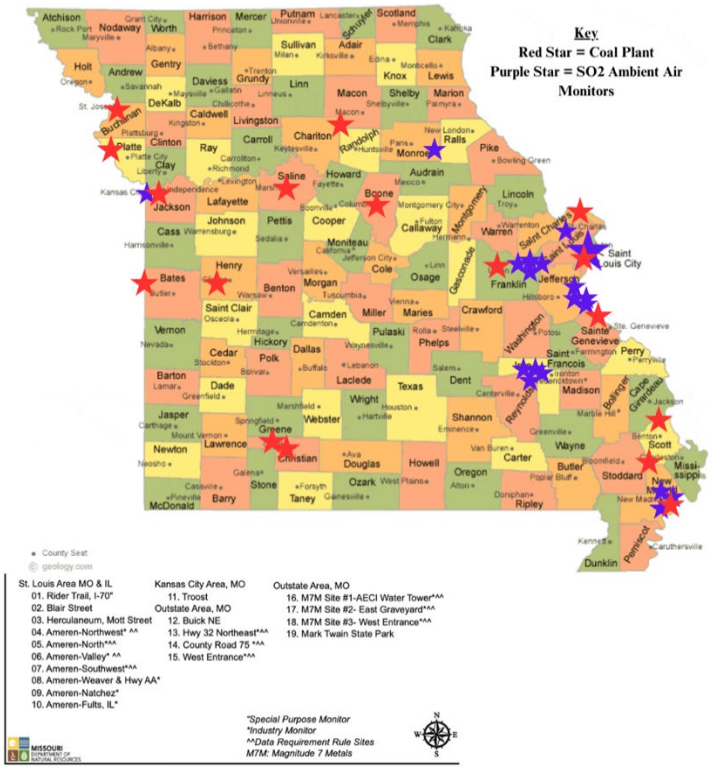
Similar inclusions would be helpful additions to an EMP in St. Louis as well and the undersigned respectfully requests DNR consider their inclusion.

The Plan Fails to Adequately Address the Pollution Risks from Coal Plants

Considering Missouri's continued over-reliance on coal-fired power, the Plan severely lacks special consideration or analysis of the air pollution risks associated with the many coal energy generation facilities operating across the state. In 2022, coal provided 66% of Missouri's electricity net generation.[18] The maps below chart the prevalence of 2024 operating coal-fired power plants around the state alongside $PM_{2.5}$ and SO_2 ambient air monitoring sites, using MDNR's own interactive Air Facilities & Air Quality Monitoring Sites map.[19] Charted alongside active coal plants, it's evident that very few air monitors endorsed by the Plan are specifically designed to monitor or address the air pollution from these coal plants.

[18] U.S. Energy Information Administration, *Missouri State Profile and Energy Estimates,* https://www.eia.gov/state/?sid=MO (last visited June 13, 2024).
[18] U.S. Energy Information Administration, *Missouri State Profile and Energy Estimates,* https://www.eia.gov/state/?sid=MO (last visited June 13, 2024).
[19] MO. DEP'T OF NAT. RES., *Air Facilities & Air Quality Monitoring Sites*, https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=d5ce711960744f74abe421312915d075 (last visited June 13, 2024); EIA U.S. Energy Atlas. "Coal: Energy Infrastructure and Resources Maps." U.S. Energy Atlas, https://atlas.eia.gov/pages/cebf469e9fc149eea7e3ff77c311b1db (last visited June 26, 2024); "Missouri Profile." U.S. Energy Information Administration (EIA), 20 July 2023, https://www.eia.gov/state/print.php?sid=MO (last accessed June 26, 2024).

Coal Plant Locations v SO2 Ambient Air Monitors



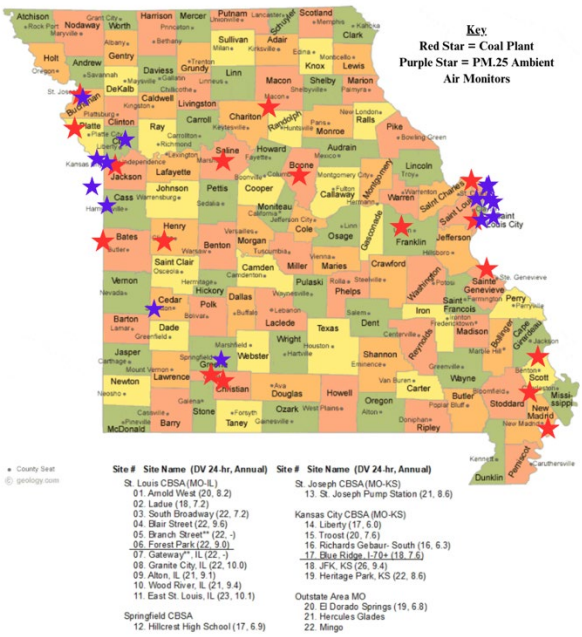
The combustion of coal produces an exothermic reaction that releases particulate, gaseous, and metallic pollutants into the environment.[20] One of the biggest pollutants from coal plants is sulfur dioxide (SO_2). Exposure to air pollutants from coal plants produces significant adverse health effects, especially for children due to their developing physiology, anatomy, metabolism, and health behaviors.[21] Additionally, people of color and impoverished groups are more likely to live close to industrial areas like coal-fired power plants.[22] The map above shows the locations of the coal plants in Missouri versus the locations of the ambient air monitors for SO_2 run by MDNR as outlined in the air monitoring plan. The undersigned call on MDNR to include more SO_2 monitors in the Plan to address the pollution from these coal facilities, especially in areas where coal plants are located in or near low-income communities of color. As shown by the map above, there is a significant lack of SO_2 monitoring around I-70 and in the southwest portion of the state, although there are many coal plants located in these areas. The

[20] Amster, E. and Lew Levy, C., "Impact of Coal-fired Power Plant Emissions on Children's Health: A Systematic Review of the Epidemiological Literature," *International Journal of Research and Public Health* 16(11), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6604200/ (June 2019).
[21] EPA. "Sulfur Dioxide Basics | US EPA." Environmental Protection Agency, 31 January 2024, https://www.epa.gov/so2-pollution/sulfur-dioxide-basics (last visited June 25, 2024).
[22] Israel, B., "Coal Plants Smother Communities of Color," *Scientific American,* https://www.scientificamerican.com/article/coal-plants-smother-communities-of-color/#:~:text=People%20living%20near%20coal%20plants,percent%20are%20people%20of%20color (Nov. 16, 2012).

lack of SO_2 monitoring near I-70 is of particular concern as people of color, as well as those with lower incomes, are more likely to live near truck routes.[23]

Coal-burning power plants are also a major source of $PM_{2.5}$ air pollution. Coal $PM_{2.5}$ is particularly rich in sulfur dioxide, black carbon, and metals with recent evidence suggesting that coal associated $PM_{2.5}$ emissions are significantly more deadly than $PM_{2.5}$ emissions from other sources. Research teams from the Harvard School of Public Health, George Mason University, and UT Austin analyzed Medicare death records from 1999 to 2023. In a study of 480 individual coal power plants, they determined that approximately every 1 $\mu g/m^3$ increase in coal $PM_{2.5}$ correlates to a morality increase by 1.12%. In relation to coal power plant retirements and air pollution regulations to directly monitor and reduce emissions, they tracked a notable decline in the number of deaths from coal $PM_{2.5}$. In the Medicare population, coal $PM_{2.5}$ deaths were 25% of all $PM_{2.5}$ -related deaths from 2000-2008. This dropped to only 7% from 2013-2016.[24]

Coal Plant Locations v PM2.5 Ambient Air Monitors



While there are industrial air monitors located at some of the coal plants in Missouri, there are not enough. Additionally, the process for determining where MDNR will require a $PM_{2.5}$ and SO_2 monitor at a coal plant is unclear. Overall, there is a significant lack of ambient air monitoring near coal plants in Missouri. The undersigned call on MDNR to implement additional air monitoring in these areas due to the high levels of emissions, the common presence of populations especially vulnerable to these coal emissions because of age, infirmity or

[23] U.S. EPA, *Control of Air Pollution From New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards Proposed Rule,* 87 Fed. Reg. 17414, 17418 (March 28, 2022).
[24] Doctrow, Brian. "Deaths associated with pollution from coal power plants." National Institutes of Health (NIH), 12 December 2023, https://www.nih.gov/news-events/nih-research-matters/deaths-associated-pollution-coal-power-plants (last visited June 26, 2024).

cumulative impacts, as well as the significant health impacts associated with the operation of these plants.

The Plan Disturbingly Fails to Address the Pollution Risks from Mining

The Plan fails to address the air pollution impacts related to mineral mining in Missouri. According to MDNR, Missouri currently has 746 active sites permitted to mine industrial minerals, under the Land Reclamation Act, and sites permitted to mine metallic minerals under the Metallic Minerals Waste Management Act.[25] Notably, Missouri leads in fire clay, lead, lime, montmorillonite, and tripoli production and is a major producer of crushed stone, cement, and zinc.[26] Common pollutants from these mining operations include sulfur dioxide and particulate matter.[27]

SO_2 is of particular concern because it reacts with atmospheric water vapor to form sulfuric acid or "acid rain."[28] Acid rain can be extremely detrimental to plants and agriculture - harming existing vegetation and making the soil unsuitable for future growth.[29] Air contamination expands to particulate matter released from the removal of minerals and physical disturbances occurring at sites[30]. Both PM_{10} and $PM_{2.5}$ have been found to decrease the air quality at and surrounding mine sites, affecting human health and deteriorating air quality[31]. Further, mining operations can cause significant adverse public health impacts for nearby communities; for example, higher levels of lead in blood have been measured in residents of some communities located near lead-zinc smelters during their operation.[32]

The Plan does not in any way address this potentially enormous source of pollution in the State. The undersigned request that MDNR include a consideration of mining-related air pollution in the Plan, and make provisions for monitoring to address it.

The Plan Fails to Address Air Pollution from CAFOs

The Plan is notably lacking in any discussion of air pollution from or air monitoring efforts directed specifically towards agriculture or concentrated animal feeding operations (CAFOs) across the state. A CAFO is an animal feeding operation that confines more than 1,000

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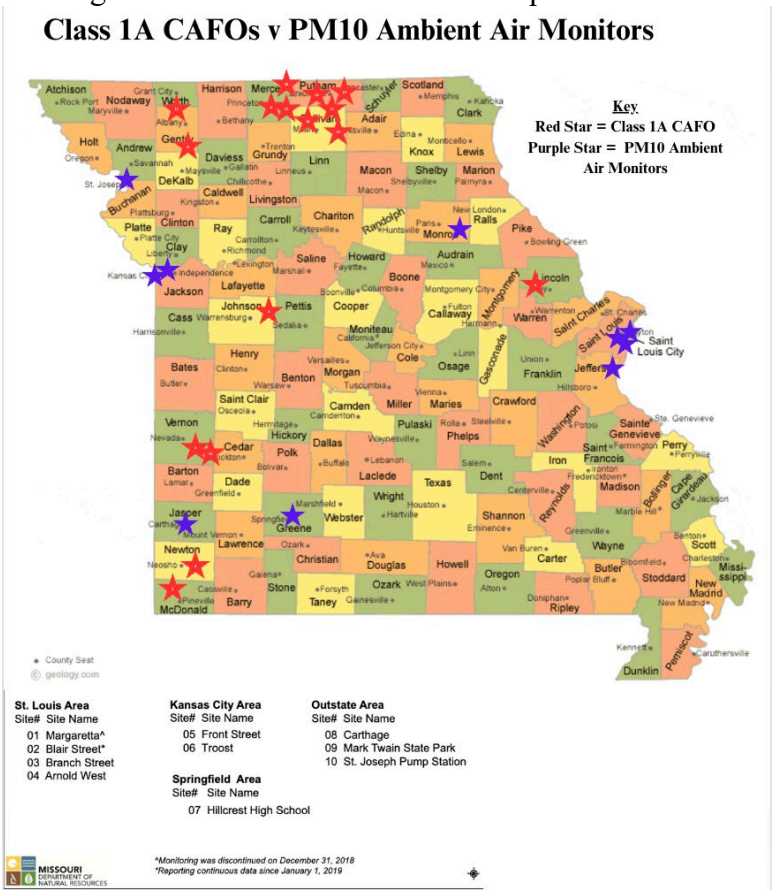
[25] *Industrial Minerals and Metallic Mineral Waste Management Areas*, MO. DEP'T OF NAT. RES., https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=9ce9dbcc86a04cd78cd5554799155ac2 (last visited June 26, 2024).
[26] *The Mineral Industry of Missouri*, USGS NAT'L MINERALS INFO. CTR., https://www.usgs.gov/centers/national-minerals-information-center/mineral-industry-missouri (last visited June 26, 2024).
[27] *How Can Metal Mining Impact the Environment*, AM. GEOSCIENCES INST., https://www.americangeosciences.org/critical-issues/faq/how-can-metal-mining-impact-environment#id4 (last visited June 26, 2024).
[28] *Id.*
[29] *Id.*
[30] *Id.*
[31] Maryna Batur and Kateryna Babii 2022 IOP Conf. Ser.: Earth Environ. Sci. 970 012004.
[32] *Id.*

animal units to be confined or stabled and fed for 45 days or more in a 12-month period. Furthermore, vegetative ground cover, including crops and forage, is not sustained over at least 50% of the confinement area. Class 1A CAFOs are the biggest category of CAFOs in Missouri, meaning that they have 7,000 or more animal units and are legally required to apply to the DNR department for construction and operating permits.[33]

Missouri Coalition for the Environment has developed various maps of all operating CAFOs across the state of Missouri that detail potential operational health impacts and site locations in relation to sensitive waste and soil resources.[34] The map below shows the charted locations of Missouri's Class 1A CAFOs versus the locations of MDNR's PM_{10} ambient air monitors as outlined in the 2024 air monitoring plan. Considering their registration requirements and emissions profiles, it is highly concerning that there do not appear to be any air monitors endorsed by the Plan designed to address CAFO-related air pollution.



[33] MO. DEP'T OF NAT. RES., "2.3.4.5 Class 1A CAFOs." MDNR, 2007, https://dnr.mo.gov/document-search/2344-class-ia-cafos.

[34] Concentrated Animal Feeding Operations – CAFOs, MO. COAL. FOR THE ENV'T.,https://moenvironment.org/our-work/sustainable-food/concentrated-animal-feeding-operations/, (last accessed June 26, 2024).

CAFOs can be extremely detrimental to both human health and the environment.[35] A recent study published in the National Academy of Sciences shows that over 17,000 annual deaths in the U.S. are attributable to pollution from farms. Of these deaths, around 80% are due to air pollution from animal agriculture.[36] CAFOs' operations have led the federal Clean Water Act to identify CAFOs as a possible point source for water pollution and in demand of proper waste management practices.[37] While a variety of pollutants may be emitted from CAFOs, the specific type and intensity of compounds depends on the operation's conditions. Commonly associated emissions with CAFOs include ammonia and nitrogen containing compounds, hydrogen sulfide, methane, particulate matter, pathogens, volatile organic chemicals (VOCs), and volatile fatty acids (VFAs). Particulate Matter (PM) emitted from CAFOs consists of fecal matter, feed materials, skin cells, and products of the microbial degradation of feces and urine. This makes bioaerosols and endotoxins the major components of particulate matter emitted by CAFOs.[38]

Repeated exposure to particulate matter can have significant adverse health effects, including chronic bronchitis, chronic respiratory symptoms, decline in lung function, and organic dust toxic syndrome[39]**.** While CAFOs present adverse health effects for all people, children are especially at-risk because they take in 20-50% more air than adults, and their bodies are still developing.[40] Researchers in North Carolina have found that the closer a child lives to a CAFO, the greater the risk that they have asthma.[41] Further, the schools that are closer to CAFOs often

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[35] NAT'L ASS'N OF LOCAL BOARDS OF HEALTH, *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities*, located at https://www.cdc.gov/nceh/ehs/docs/understanding_cafos_nalboh.pdf
[36] Domingo, N. et al., "Air quality–related health damages of food," *PNAS* (May 10, 2021), located at https://www.pnas.org/doi/10.1073/pnas.2013637118.
[37] EPA. "Proposed Regulations to Address Water Pollution from Concentrated Animal Feeding Operations." Environmental Protection Agency, 2001, https://www3.epa.gov/npdes/pubs/CAFO-brochure3.pdf. Accessed 26 June 2024.
[38] Michigan Department of Environmental Quality Toxics Steering Group, *Concentrated Animal Feedlot Operations Chemicals Associated with Air Emissions* (May 10, 2006), located at https://www.michigan.gov/-/media/Project/Websites/mdhhs/Folder1/Folder50/CAFOs-Chemicals_Associated_with_Air_Emissions_5-10-06.pdf?rev=ac7b6d7bb56c4b85a378ce8fb9a30442.
[39] Michigan Department of Environmental Quality Toxics Steering Group, *Concentrated Animal Feedlot Operations Chemicals Associated with Air Emissions* (May 10, 2006), located at https://www.michigan.gov/-/media/Project/Websites/mdhhs/Folder1/Folder50/CAFOs-Chemicals_Associated_with_Air_Emissions_5-10-06.pdf?rev=ac7b6d7bb56c4b85a378ce8fb9a30442.
[40] Kleinman, M., "The Health Effects of Air Pollution on Children," *South Coast Air Quality Management District* (Fall 2000), located at http://www.aqmd.gov/docs/default-source/students/health-effects.pdf.
[41] Barrett, J., "Hogging the Air: CAFO Emissions Reach into Schools," *Environmental Health Perspective* 114(4), located at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1440820/#:~:text=Of%20the%20226%20schools%20included,reported%20noticeable%20livestock%20odors%20indoors.

are attended by students of lower socioeconomic status.[42] Particulate matter is of especially great concern because exposure over a long period of time can lead to decreased lung function.[43]

Many of Missouri's Class IA CAFOs utilize anaerobic digesters to create and capture biogas.[44] Understanding that some states already require air permits for livestock anaerobic digesters, we believe it is also necessary for Missouri to consider monitoring and/or permitting these systems to better understand and regulate emissions from anaerobic digestion and biogas capture. We ask that MDNR make evident in the Plan what air quality monitoring and/or permitting is currently being done at these CAFOs, if any.

Further, although ambient monitoring of ammonia, hydrogen sulfide, and methane emissions is not required by applicable laws and regulations, the undersigned urge MDNR to address these dangerous CAFO-related pollutants as well. MDNR includes no proposed monitors to address these three dangerous pollutants in the Plan, even though these pollutants are dangerous to public health. The undersigned believe it would be appropriate for MDNR to utilize Special Purpose Monitors (SPMs) to address these dangerous CAFO-related emissions.

All CAFO emissions can be categorized by health benchmarks and regulatory levels to determine their level of concern.[45] These chemical concern benchmarks all include uncertainty in exposure rates and associated health effects. This includes those lowest dosages at which no adverse effects are seen then are divided by uncertainty factors to account for species differences or possibilities of populations or individuals to have higher sensitivity to chemical's effects. Minimal Risk Levels (MRLs), as developed by the Agency for Toxic Substances, notes acuate, intermediate and chronic inhalation exposures. An MRL would estimate the level of daily human exposure and specified duration of exposure to a hazardous substance without appreciable risk of adverse noncancer health effects. A Reference Concentration (RfCs), as developed by the EPA, determines acceptable air concentrations of chemicals. An RfC describes a 24-hour air concentration which would not be expected to cause adverse health effects over a person's lifetime. Permissible Exposure Levels (PELs), as developed by the Occupational Safety and Health Administration (OSHA), targets workplace exposure. PELs are time-weighted to average concentrations that must not be exceeded during any 8-hour work shift of a 40-hour workweek.

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[42] Mirabelli, M. et al., "Race, Poverty and Potential Exposure of Middle-School Students to Air Emissions from Confined Swine Feeding Operations," *Environmental Health Perspective* 114(4): 591-596, located at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1440786/.

[43] Michigan Department of Environmental Quality Toxics Steering Group, *Concentrated Animal Feedlot Operations Chemicals Associated with Air Emissions* (May 10, 2006), located at https://www.michigan.gov/-/media/Project/Websites/mdhhs/Folder1/Folder50/CAFOs-Chemicals_Associated_with_Air_Emissions_5-10-06.pdf?rev=ac7b6d7bb56c4b85a378ce8fb9a30442.

[44] U.S. EPA, *AgSTAR Livestock Anaerobic Digester Database*, located at https://19january2021snapshot.epa.gov/agstar/livestock-anaerobic-digester-database_.html.

[45] Michigan Department of Environmental Quality Toxics Steering Group, *Concentrated Animal Feedlot Operations Chemicals Associated with Air Emissions* (May 10, 2006), located at https://www.michigan.gov/-/media/Project/Websites/mdhhs/Folder1/Folder50/CAFOs-Chemicals_Associated_with_Air_Emissions_5-10-06.pdf?rev=ac7b6d7bb56c4b85a378ce8fb9a30442.

In the 2024 Plan, MRLs are not mentioned nor are PELs. EPA RfCs are used to determine the adjusted concentration for PM_{10} exposure.

Considering the significant adverse health and environmental effects that CAFOs can have on communities, the Plan proposes a noticeable lack of air monitoring to address these facilities. The map above shows the locations of Missouri's Class 1A CAFOs versus the locations of MDNR's PM_{10} ambient air monitors as outlined in the 2024 air monitoring plan. As shown on this map, most of Missouri's Class 1A CAFO operations are concentrated in the northwest portion of the state, particularly in Sullivan, Putnam, and Mercer counties. The Plan proposes virtually no PM monitoring in these same locations. The undersigned call on MDNR to add monitors to the Plan to address this significant source of pollutants.

Concern Over Functionality of Certain Air Monitors

The undersigned remain concerned over the functionality of certain air monitors that are a part of the monitoring network as laid out in the Plan. In past years, there have been numerous instances when data was missing from both primary and secondary air monitors in certain locations; when MDNR had to rely on data from a secondary air monitor because the primary one was inoperative; or when both data sets failed to meet the completeness criteria set forth in 40 C.F.R. Part 50. Most recently, within last month alone, ozone data was 'missing' for the Trimble (Kansas City) air monitoring site on three occasions.[46]

Given the history of unavailable data at the Hillcrest High station site and the newest trend of missing data for the Trimble site, combined with the complicated site functionality, the undersigned respectfully request that MDNR provide a more easily accessible source or link where information about air monitor functionality can be found. Ensuring data accessibility is crucial not only for agencies, but also deeply important for members of the communities most directly impacted.

MDNR Should Embrace and Support Community Air Monitoring as Part of the Plan

In 'proposed change #1," MDNR proposes to "monitor air toxics in Kansas City," and to "evaluate low-cost sensors for particulate matter and other pollutants at multiple sites in Missouri subject to funding under an Inflation Reduction Act Clean Air Grant." The estimated start date is "as soon as possible." In light of the undersigned's extensive concerns that the State criteria pollutant monitors fail to provide sufficient and meaningful information about air quality around the state, we respectfully request more information on DNR's plan to implement and evaluate these proposed community monitoring projects.

Along with data from various organizations engaged in community air monitoring projects around the state, the undersigned see great value in using the air quality monitoring data

[46] Monitoring data was obtained from MDNR, *Air Pollutants and Sources,* individual pollutant sites, located at https://dnr.mo.gov/air/hows-air/pollutants-sources.

collected by the state to educate and empower residents about their air quality, and to advocate in support of the need for stricter air pollution controls. There is currently no federal or state regulatory support for the type of citizen data these systems will collect, either in the air permitting process, or the state implementation planning processes. However, the opportunity certainly exists for EPA and MDNR to engage with citizen data on many levels – through community education and engagement; pollution control planning, stationary source permitting being just a few. To the extent MDNR supported citizen science efforts, the data could be used for community engagement and education on a state regulatory level. In addition, organizations such as the undersigned and its clients and partners could use their data to work with MDNR to lobby for additional funds to be directed to MDNR for monitoring purposes. The undersigned respectfully request that MDNR consider enacting regulations that recognize and support community science.

We look forward to MDNR's response to these comments. Thank you for your consideration.

Great Rivers Environmental Law Center

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Great Rivers Environmental Law Center Comment Response:

The Plan Fails to Comply with Title VI of the Civil Rights Act of 1964.
Comment authors argue that the plan violates Title VI of the Civil Rights Act of 1964 because (1) the department does not have procedural safeguards in place under the Code of Federal Regulations (CFR) Title 40, §§5 and 7; and, (2) the plan fails to evaluate disproportionate impacts and disparate impacts on protected class communities.

The purpose of the Annual Monitoring Network Plan is to fulfill the obligation under 40 CFR 58.10(a), requiring the Missouri Department of Natural Resources to assess and demonstrate that its ambient air monitoring network meets the applicable monitoring requirements of 40 CFR Part 58, and to identify any proposed network changes. The primary purpose of the monitoring network is to determine whether areas in Missouri are meeting National Ambient Air Quality Standards (NAAQS). The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to establish NAAQS for designated Criteria Pollutants and the states to adopt enforceable plans to achieve those standards.

The department followed its process for public notice and comments. The department posted the plan on the internet for 30 days for public review and comment as required by the same regulation and in accordance with Title VI procedural safeguards. The department announced the availability of the plan for public review by email to 5,546recipients on various mailing lists of persons who have expressed an interest in receiving information from the Air Pollution Control Program with an 90 percent delivery success rate. This final version of the plan includes the comments received and the department's responses to comments.

The department has Title VI procedural safeguards as required by 40 CFR Parts 5 and 7. (https://dnr.mo.gov/ada-non-discrimination), (https://dnr.mo.gov/document-search/notice-under-americans-disabilities-act), (https://dnr.mo.gov/document-search/grievance-procedures-under-americans-disabilities-act), (https://dnr.mo.gov/document-search/modnr-policy-111-external-complaint-response-policy), (https://dnr.mo.gov/document-search/external-complaint-discrimination-form-mo-780-2926).

All monitors in the Missouri air monitoring network, including those operated by the state and industries under state review, meet the applicable requirements of 40 CFR 58, and siting requirements described at Appendix E. The monitoring plan does not violate Title VI. Comment authors assert Title VI was violated by failing to consider disparate impacts (a Title VI consideration), disproportionate impacts (federal policy guidance) and cumulative impacts (Federal policy guidance). First, the authors provide no specific justification for the alleged deficiency. The authors present no data for the department to respond or evaluate in terms of the pollutant/siting requirements of the law. Next, the authors identify a failure to conduct a disproportionate impact or cumulative impact analysis. However, the purpose of a monitoring plan is to measure effects of air emissions on communities throughout the state in locations determined according to the pollutant/scale specific requirements per 40 CFR 58. The pollutant specific siting requirements at Appendix E do not include guidance on how to identify impacts in terms other than specific pollutants to warrant moving monitors from one location to another. Lastly, as described in more detail below and in the 2018 Monitoring Network Plan

(https://dnr.mo.gov/document-search/2018-monitoring-network-plan), the Blair Street site measures the NO_2 exposure of a susceptible and vulnerable community, and the Forest Park and Rider Trail sites measure the concentrations of NO_2 near the I-70 and I-64 highways.

The Plan Contains Insufficient Ozone Monitoring

The comment authors focus on ozone and NO_X monitoring in the St. Louis area. The 2021 – 2023 ozone design value for the St. Louis area is 0.074 parts per million (ppm). In consideration of the design value and the population of the St. Louis core-based statistical area (CBSA) of 2,796,999, the required number of ozone monitors in the St. Louis area is two (40 CFR 58, Appendix D). There are currently eleven ozone monitors in the St. Louis CBSA, seven in Missouri and four in Illinois. The ozone monitoring network in the St. Louis area is considerably denser than the minimum regulatory requirement.

Chemical reactions of a combination of primary pollutants emitted from stationary and mobile sources cause the formation of ozone. Therefore, ozone tends to be regional, not local in its distribution. The highest concentration of ozone in an urban area is generally downwind of the city center. The network in the St. Louis CBSA in Missouri includes one site upwind of the city center, one in the city center, and five sites downwind of the city center, distributed so as to capture the highest concentration regardless of variations in wind direction. The West Alton site in St. Charles County, approximately 16 miles north of and generally downwind of the city center, has consistently been the design value site for the Missouri side of the St. Louis CBSA. The Blair Street site in St. Louis City is an indicator of the ozone exposure of persons living in the city.

Appendix D of 40 CFR 58 requires 40 NO_2 monitors nationwide to be located in susceptible and vulnerable communities. For CBSAs with a population greater than 2.5 million, USEPA requires two near-road sites. Previously, the Margaretta site in St. Louis was designated as an NO_2 site located in a susceptible and vulnerable community. The department replaced Margaretta for this designation with the Blair Street site as described in the 2018 Monitoring Network Plan (https://dnr.mo.gov/document-search/2018-monitoring-network-plan), which USEPA approved in 2019. The Forest Park and Rider Trail sites measure the concentrations of NO_2 near the I-70 and I-64 highways in the St. Louis area. The department has identified and is working to establish a new near road site in the Kansas City area. Recent NO_2 design values for all sites are significantly less than the NAAQS. In addition, there is one NO_2 monitoring site in the St. Louis CBSA in Illinois and one NO_2 monitoring site in the Kansas City CBSA in Kansas.

The department is in the process of developing an Enhanced Monitoring Plan (EMP). The department has had discussions with local agencies, community groups, universities, the Illinois Environmental Protection Agency (IEPA), and USEPA Region 7 as a part of the development process. While the plan is still under development, the department has already identified an area which will likely be included in the final EMP, which is to add two additional NO_2 monitors to the St. Louis CBSA. The department was awarded Inflation Reduction Act funds in June of this year to install NO_2 monitors at the existing West Alton and Arnold West monitoring locations. The goal of installing the monitors at these locations is to gain a better understanding of NO_2 and

O_3 in the St. Louis CBSA. As a part of the grant application, the department committed to providing a final report of our findings to the USEPA at the end of the project period.

The Plan Fails to Adequately Address the Pollution Risks from Coal Plants
The purpose of the Annual Monitoring Network Plan is to fulfill the obligation under 40 CFR 58.10(a), requiring the department to assess and demonstrate that its ambient air monitoring network meets the applicable requirements of 40 CFR 58, and to identify any proposed network changes. Thus, the plan addresses ambient air monitoring and does not describe all of the other activities of the Air Pollution Control Program, which includes permitting, compliance and enforcement, promulgation of rules, and planning activities related to meeting other federal requirements.

Coal-fired power generation plants, along with other facilities, require permits that include conditions on fuel use and require record-keeping, including source monitoring of the flue gas emitted from the plant. Ambient concentrations of pollutants, for example, sulfur dioxide (SO_2) can be measured by air monitors or can be conservatively estimated using air quality simulation modeling based on plant physical parameters, flue gas emission rates, and pollutant concentration measured in the flue gas. As discussed below, and as discussed in the monitoring plan where applicable, the air quality impacts of all coal-fired power plants in Missouri are being characterized by either air monitoring or by modeling.

The process for the most recent SO_2 monitor placements in Missouri followed the data requirements rule (DRR). The DRR applies to facilities with greater than 2,000 tons per year of actual SO_2 emissions. The DRR not only provides for monitoring; it provided three ways that a facility could characterize air quality to comply with the rule: through ambient air quality monitoring, through air quality modeling, or through establishment of permanent enforceable limits of SO_2 emissions to less than 2,000 tons per year. Each of the following facilities referenced in the comment chose the modeling option for compliance with the DRR: Thomas Hill Energy Center, Sikeston Power Station, John Twitty Energy Center, and Flint Creek Power Plant. The University of Missouri plant chose an enforceable emission limit, and the other power plants in Columbia are no longer burning coal.

The process the department uses for $PM_{2.5}$ design criteria is based on 40 CFR Part 58 Appendix D. A detailed analysis of the process can be found in the 2020 Monitoring Network Assessment (https://dnr.mo.gov/document-search/2020-missouri-air-monitoring-network-assessment). The department $PM_{2.5}$ monitoring network far exceeds the minimum monitoring requirements of 40 CFR Part 58 Appendix D. 40 CFR Part 58 Appendix D requires at least three $PM_{2.5}$ monitors be installed in the St. Louis and Kansas City CBSAs. There are a total of eleven $PM_{2.5}$ monitors in the St. Louis CBSA and five in the Kansas City CBSA (six when the near-road site goes online).

The Plan Disturbingly Fails to Address the Pollution Risks from Mining
As stated above, the primary purpose of the plan is to fulfill the regulatory requirement for the submittal of an annual monitoring network plan. The plan addresses ambient air monitoring and does not describe all of the other activities of the program, which includes permitting, compliance and enforcement, the promulgation of rules, and planning related to meeting other federal requirements. Mining operations require permits that include emission limits.

A portion of the comment states that "common pollutants from these mining operations include sulfur dioxide and particulate matter," referencing https://www.americangeosciences.org/critical-issues/faq/how-can-metal-mining-impact-environment#id4 as a source. It is important to clarify that the source refers to smelting as the source of SO_2 emissions.

The last primary lead smelter in the U.S., in Herculaneum, Missouri, ceased operation at the end of 2013 halting SO_2 emissions from the mining activity. Lead mining and secondary smelting activities continue to occur in Missouri. An SO_2 monitor is adjacent to one of the two secondary lead smelters.

The department significantly expanded the network of lead monitors in Missouri in 2010 following the adoption of a more stringent lead NAAQS in 2008. The network included monitors in areas near the former primary smelter, active secondary smelters, active lead mines and mills, and areas where lead mining waste was disposed of in the past, some of which were undergoing remediation. None of the monitors showed a violation of the lead NAAQS attributable to mining or milling operations. Monitors near the active secondary smelters and former primary smelter showed exceedances of the NAAQS in the past but not in recent years. The most recent exceedance near the primary smelter resulted from demolition activities after the smelter ceased operation. The department continues to monitor lead near the secondary smelters and in the area near the discontinued primary smelter.

Particulate matter, primarily PM_{10}, can be a result of mining operations or related minerals processing activities. One of the department's PM_{10} monitoring sites, near Carthage, Missouri, is located near such a facility. The department continues to work with that facility to minimize emissions of particulate matter.

The Plan Fails to Address Air Pollution from CAFOs
This comment states that the plan lacks discussion of air pollution from Concentrated Animal Feeding Operations (CAFOs).

The purpose of the Annual Monitoring Network Plan is to fulfill the obligation under 40 CFR 58.10(a), requiring the department to assess and demonstrate that its ambient air monitoring network meets the applicable monitoring requirements of 40 CFR 58, and to identify any proposed network changes. The primary purpose of the monitoring network is to determine whether areas in Missouri are meeting the NAAQS. The CAA requires USEPA to establish NAAQS for designated Criteria Pollutants and the states to adopt enforceable plans to achieve those standards. Most Animal Feeding Operation (AFO) air emissions of concern are not classified as Criteria Pollutants and are, therefore, not regulated by any federal AFO-specific NAAQS under the CAA.

Appendix D of 40 CFR 58 specifies the approximate number of permanent stations required in Metropolitan Statistical Areas (MSAs) to characterize PM_{10} concentrations in areas where the population exceeds 100,000 residents. In a comparison of the 2023 United States Census Bureau Population Estimates (https://www2.census.gov/programs-surveys/popest/tables/2020-2023/metro/totals/cbsa-met-est2023-pop.xlsx) with the comment author's CAFO map, the MSAs containing a CAFO with populations over 100,000 include Joplin (Newton County) and St.

Louis (Lincoln County). The Joplin MSA includes one PM_{10} monitor and the St. Louis MSA includes four PM_{10} monitors (three in St. Louis and one in Illinois).

The Annual Monitoring Network Plan documents that Missouri's air monitoring network complies with current federal regulations, details any changes proposed following its publication and submittal, and provides specific information on the existing and proposed monitoring sites. Other activities of the air program, such as permitting, compliance and enforcement, planning, minimal risk levels, reference concentrations, permissible exposure levels, and promulgating rules, fall outside the scope of the plan.

Concern Over Functionality of Certain Air Monitors

The comment authors stated that there are instances when both the primary and secondary ozone instruments are not reporting and specifically lists the Trimble site as recently having issues. Monitoring shelters are susceptible to the same power failures and communication outages that average residences and businesses experience. The instruments themselves rely on pumps and solenoids to perform continuously, and occasionally, these parts fail causing data loss that is ultimately unavoidable. In the case of the Trimble site, the shelter that houses the sensitive instrumentation was failing and needed to be replaced. The shelter replacement lasted from noon on May 28, 2024, through noon on May 29, 2024. The instruments were turned on after the shelter was installed and given time to equilibrate, followed by a calibration the next morning.

The comment authors also mention needing to rely on a secondary instrument if the primary is inoperable. Secondary instruments are usually of the same make and model as the primary and produce data of comparable quality and are secondary only in name. 40 CFR Part 58 requires that only one monitor for each pollutant be designated in AQS as the primary monitor for a given period of time. The department views the ability to provide the public with accurate ozone concentrations even if one monitor is experiencing issues as a strength of the ozone network. Only one other state in USEPA Region 7 reports having a primary and secondary ozone monitor at each site. Illinois, which is in USEPA Region 5, does not have secondary ozone monitors.

The comment authors also mentioned $PM_{2.5}$ data incompleteness at the Hillcrest High School site in Springfield, Missouri. The department strives to ensure maximum data completeness at all ambient air monitors in Missouri's network. One way the department maximizes complete data is through regular quality control verifications at the monitoring sites. Quality control verifications are performed at the Hillcrest High School site twice per month. The department is also continually updating quality control procedures as new information about maintaining the instruments comes available.

The department makes every effort to make air pollution data available to the public. Near real-time data is available on the department's website (https://dnr.mo.gov/air/hows-air/pollutants-sources). The AirNow website is also an excellent source current data https://www.airnow.gov/. Not only does this site provide the combined Air Quality Index, but users can filter by pollutant of concern and see trends through graphs etc. Citizens interested in historical data can download daily and annual averages from USEPA's Interactive Map of Air Quality Monitors at the following webpage: https://www.epa.gov/outdoor-air-quality-data/interactive-map-air-quality-monitors.

Interested parties may contact the department's Air Pollution Control Program or Environmental Services Program about the status of a particular ambient air monitor anytime.

MDNR Should Embrace and Support Community Air Monitoring as Part of the Plan
The department is supportive of community monitoring projects and has participated in projects.

The purpose of the Annual Monitoring Network Plan is to fulfill the obligation under 40 CFR 58.10(a), requiring the department to assess and demonstrate that its ambient air monitoring network meets the applicable monitoring requirements of 40 CFR 58, and identify any proposed network changes. Compliant monitoring requires the use of Federal Reference Method (FRM) or Federal Equivalent Method (FEM) instruments and following strict protocols for instrument operation and quality assurance. Current community monitoring projects typically involve the use of less expensive sensors that do not meet the federal requirements for air monitoring, but nevertheless provide useful data, typically with enhanced spatial density. These projects are therefore outside the scope of the plan.

The department chose to include the toxics monitoring and sensor studies in the Monitoring Network Plan as a way to keep the public informed about other monitoring activities. As stated in the draft Monitoring Network Plan, the department received Inflation Reduction Act funds in 2023 to perform toxics monitoring in Kansas City and perform a study on air quality sensors.

- The department committed to purchase and install the equipment necessary to operate toxics monitoring at the existing Troost monitoring location for at least one year. The department agreed to perform toxics monitoring very similar to the National Air Toxics Trend Station (NATTS) monitoring that is occurring at our Blair St. location in St. Louis. At the end of the project, the department committed to providing a report very similar to the annual report submitted evaluating the NATTS monitoring at Blair St. The annual report is an analysis of cancer and noncancer risks associated with inhalation exposure to air toxics. The report includes a comparison of the measured concentrations with the most recent AirToxScreen assessment.
- The department committed to purchasing thirty-two nonregulatory air monitors to perform a study against the department's regulatory monitors. The department plans to purchase four different makes/models of nonregulatory monitors as a part of this study. Most of the nonregulatory monitors involved in this study will be considered "low cost;" however, the department did commit to purchase some nonregulatory monitors that are outside of what is considered "low cost." The nonregulatory monitors will be compared against SO_2, O_3, NO_2, CO, PM_{10}, and $PM_{2.5}$ regulatory monitors. The study will last at least one year. The goal of the study is to evaluate the durability and quality assurance/maintenance requirements in an effort to learn how to best deploy and operate the nonregulatory monitors and to put the department in a more informed position to communicate with the public about the monitors.

The department was awarded additional Inflation Reduction Act funds in 2024. The award included, but was not limited to:

- Fully upgrading the toxics monitoring at the Troost monitoring location to match the NATTS monitoring occurring at Blair St. and to extend funding to continue the monitoring for at least three additional years (four total).
- Purchasing thirty nonregulatory air monitors to install on the properties of state, county, and/or local government throughout the State of Missouri. Some potential installation locations include department regional offices, Missouri state parks, county/municipal health departments, universities, or public schools. The department committed to prioritizing census tracts identified as disadvantaged using the Climate and Economic Justice Screening Tool (CEJST; https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5) and/or census block groups that are at or above the 90th percentile for any of EJScreen's Supplemental Indexes when compared to the nation or state (https://ejscreen.epa.gov/mapper/) when identifying nonregulatory monitor placement.

The department did not make any changes to the 2024 Monitoring Network Plan related to this comment.

Corrections in Final Version (Revision 1) of the 2024 Monitoring Network Plan

The department corrected some errors discovered in Appendix 1. The Method codes for all Thermo 1405F PM25 instruments were changed from 181 to 581.

After the close of the comment period, on July 1, 2024 the department received an e mail from Great Rivers Environmental Law requesting that Missouri Coalition for the Environment be added to their comment as a co-signer.

The department has made no other changes to the 2024 Monitoring Network Plan.